MONTHLY

JOURNAL OF AGRICULTURE.

NO. 7. JANUARY, 1846. VOL. I.

A NEW-YEAR'S OFFERING TO OUR PATRONS.

IMPORTANT TO ALL OWNERS OF CATTLE.

A VERY remarkable discovery has been made in France, in a department of rural Industry, which, could a word be coined for the occasion, might perhaps most aptly be called LACTEOLOGY, or COW-OLOGY, as it discloses infallible signs for determining the *milking properties of Neat Cattle.*

By these external marks, which are described by the author of the work, and illustrated by numerous engravings, now in course of preparation for the FARMERS' LIBRARY, it is maintained that one may without fail discover, even in a calf of a few months old, whether it will make a good milker, and is, therefore, worthy of being reserved for the dairy; or, if otherwise, it should be consigned to the butcher. Strange as may appear such a discovery, and the establishment of an infallible system based upon it, it yet seems to have been in very many cases subjected to the severest test, by committees of men of the highest character in France, appointed by and belonging to the agricultural section of the Academy of Sciences, who have certified in the most unequivocal manner to the truth and great value of the discovery. The testimony of scientific men of that grade and association, in France, it need not be added, challenges universally, public respect and confidence. We consider ourselves fortunate in being, by a lucky chance, made the medium of first proclaiming this French discovery to English readers; and, moreover, feel justified in referring to it as another proof that, acting under the instruction of liberal Publishers, *no trouble or expense* will be allowed to stand in the way of our fulfilment of all the promises with which the FARMERS' LIBRARY was offered to the patronage of American Agriculturists.

While waiting for the illustrations, in the hands of the engraver, and which will be numerous and costly, we offer here the "PREFACE OF THE TRANSLATOR," N. P. TRIST, Esq. of the State Department, a gentleman well known, and wherever known respected, for high character, learning and discernment; and who, previously to his acceptance of the office he so well fills, had been in a position which led him to give much attention to such subjects.

It has so happened in corroboration of all that is said in relation to this extraordinary discovery, that since writing so far, we find it particularly noticed in a late number of the "*Journal d'Agriculture Pratique et de Jardinage,*" sent to our Publishers by Doctor LARDNER, now in Paris.

Some extracts from that notice on the spot where the theory has been promulgated, may serve to rivet still stronger the attention of the reader:

"Monsieur GUENON, a farmer of Libourne, having discovered an infallible method of ascertaining the lactiferous properties of cows, by means of certain invariable signs, easily to be found on these animals, invited a rigid investigation of his theory, by the Agricultural Society of Toulouse. A committee was accordingly appointed by that Society, who reported:

"We conducted Mr. Guénon into seven cow-stables with which he was entirely unacquainted. Here forty-six cows were submitted to his inspection. In twenty-two instances he named the *exact number of pints given by each cow*; in fourteen he came within a pint, and in ten within two or three pints.

"Exact precision as to number of pints, however, is deemed as of little importance, as the quantity of milk is liable to vary, with many circumstances, as food, temperature, date of calving, &c. But the main fact of the discovery we *consider as established*, as Monsieur Guénon invariably distinguishes the good from the bad milkers.

"From this fact, with which the committee was much struck, there results the consequence that there is really a relation existing between the milking properties and the visible external signs or escutcheons indicated.

"The Committee consider as a vast service rendered to Agriculture, a discovery which has taught us to distinguish good from bad milkers, and it is the greater as the system applies to calves, and thus enables us to discard, by handing over to the butcher, worthless heifers, that we would otherwise be at the expense of rearing.

"To make known as widely as possible *this valuable discovery*, the Committee recommend the nomination of Mons. GUENON, as a corresponding member of this Society and the purchase of 25 copies of his work."

Let us take the occasion to salute our patrons with "a happy new year." We are grateful for their liberal encouragement, and if they are not as numerous as we could wish, they are quite as much so as we could have reasonably expected, and will make up in quality for want of numbers. Finally, we have every reason to be grateful for the past and confiding as to the future—and all we have now to ask is, that those who think favorably will speak kindly of our labors to advance the most important interest of the country.

TREATISE ON MILCH COWS.

THE TRANSLATOR TO THE READER.

Nonsense! Who can believe any such thing? What! by merely looking at a cow, to be able to tell how much milk she is capable of being made to yield; and, also, how long she can continue to give milk after being got with calf!—to be able thus to ascertain, not only what are the qualities of a full grown cow, but what are to be the qualities of any heifer-calf, by looking at her while yet but two or three months old! Surely, if ever there was a humbug, this is one.

Softly, Mr. Reader! You are very incredulous, no doubt, but I defy you to be more so than I was when in your present position. What is more, I defy you to cling to your skepticism over an hour or so. However strong and firm it may be at this moment, it will, in a little while, have vanished into nothing; and its place will be filled by another solid proof in addition to the many you must already have stored up, that

> "There are more things in heaven and earth ——,
> Than are dreamt of in your philosophy."

When this discovery was first mentioned to me, as one which had recently been published in France, I smiled at the credulity of some people. My informant, perceiving what effect the announcement had upon me, said, "It is so, however;" and then, nothing but politeness toward a stranger, for the first time under my roof, prevented my replying, "You do not really believe this to be possible."

He offered to send me the book; and, though I had not the least idea of throwing away my time in reading it, civility would not allow me to decline. It came, and I opened it with the intention merely of looking into it sufficiently to say that I had done so. When, however, in turning the pages over, I saw that this piece of quackery, as I felt very sure the pretended discovery must be, had engaged the attention of distinguished Agricultural Societies in France, and had earned "Gold Medals" for its author, in a country where they are not prone to be lavish of such substantial marks of approbation, my curiosity was awakened, and I had soon read enough to bring home to me once more, for the thousandth time, that homely old truth, "We live to learn."

Since then, many things have occurred to strengthen my confidence in the reality of this discovery, and in its high practical value to all interested in the preservation and improvement of milk stock—and who is it that is not interested in its productiveness? The most recent of these incidents is as follows:

A friend to whom I had lent the translation accompanied with the plates which are requisite to make it intelligible, showed it to a man from the country whose calling had rendered him quite conversant with the subject of cattle. This person's curiosity was so far awakened, that, beside attending to the explanations made to him, he took a sketch of some of the *escutcheons*. After an absence of some weeks, he returned to the city where this had happened, and came to see my friend. "That thing (said he) is as true as a book. There is no mistake about the matter. Since I was here, I have looked at more cows than ever you saw, and I am perfectly satisfied that the thing is just as the Frenchman says. I have become convinced, too, of another thing: that our breeds of cattle are by no means the great things they are cracked up to be." N. P. T.

☞ This important Treatise will be continued in the February Number of this Work.

THE MARYLAND FARMERS' CLUB.

ON THE RIGHT TACK.

We have already more than once expressed our humble persuasion of the utility of FARMERS' CLUBS; and feel much gratified in the belief that they will spring up and do good service in all parts of the Union.

The one which has been recently formed at Baltimore, Md., has started right foot foremost, by taking effectual measures to promote *intellectual inquiry and scientific investigation into matters of obvious importance*. The results of such investigations bring new facts to light, lift Agriculture from the mire, cause it to be respected as a pursuit worthy at once to task and to amuse the mind of the scholar and the man of science; and according as it is pursued in that spirit, to augment the best sort of stock, that man can covet or possess—*the stock of knowledge*. We rejoice to know that we shall see, from time to time, the proceedings of this respectable Club in their "*organ*," the old AMERICAN FARMER; which, by the bye, has come out in new and fashionable attire, looking as fresh and vigorous as an old fruit tree recently and judiciously pruned and washed over and scrubbed with soap suds and *sands!* The Club could not have a better Repository for their good works. We would gladly copy all their proceedings as we find them in the Baltimore Patriot, but that cannot be expected of a work like this, intended so much more for the promulgation of principles than for the register of details.

We tender our thanks to the CLUB for their compliment in recommending the FARMERS' LIBRARY, and with the blessing of Providence, and the *liberality of our Publishers*, who restrict us in nothing, *we mean to deserve it*. The following item of their proceedings, however, presents such a prominent feature, and is so much in a spirit that we have been earnestly commending, that we take leave to hold it up as worthy of imitation:

"On motion of Danl. Bowly, Esq. it was resolved, that the regular subject for discussion at the next meeting be the disease now making such havoc of the potato throughout the world, that if possible, its farther spread in Maryland may be stayed—and, to this end, that the Chemists and Geologists of the Club, Professors Ducatel and Baer, be each requested to procure at least one pound of potatoes in this state of peculiar disease, and to select at least one pound each of those in a perfectly healthy condition, for analyzation; that they each be authorized to conduct and complete a separate analysis of both descriptions; furnish the particulars at the next meeting of the Club, and accompany the same with an opinion, in the abstract, as to whether it be an internal disease, and if so, what remedy may be applied, and whether it be microscopic animalculae, and if so, whether in the pupæ or larvæ state, and what measures, in their opinion, should be adopted to prevent its generation—or, if it be a parasitic superficial fungus—also that \$50, \$12 50 for each separate analysis, or so much thereof as may be needed, be appropriated out of the funds of the Club to defray the expenses of said analysis."

Here, then, the reader sees that these gentlemen are not satisfied to take all out in talking. They designate an important subject, call upon the Chemist and the Geologist "*of the Club*," and put their hands in their pockets to defray the expense of the required analyses, and we doubt not their reports will be of more real service to the cause of Agriculture, than would an exhibition of twenty of the fattest cattle ever reared and stuffed on the "South Branch." We shall keep a look-out for these reports, to publish and send them to the distinguished Commissioners engaged in precisely the same investigations in Ireland, but *there* at the *instance of the Prime Minister*, MR. PEEL, and doubtless to be munificently compensated. And so should all such men, so engaged, be compensated.—Their Geological and their Chemical knowledge *is their trade*,—acquired at great expense of money, time and labor. Their crucible is to them what the anvil is to the smith, and the plow to the farmer, and the sword to the military man—with *this exception, that* the *Government* gives the sword and *a life commission and high pay along with it*, whether it be used or not; and with one other exception—the crucible, the anvil and the plow are instruments of *knowledge and support*, the sword for the *slaughter of the human family*.

That noble friend of Agriculture—noble in the best sense of the word—the late EARL SPENCER, at a general meeting of the Royal Agricultural Society of England, especially recommended the formation of *Farmers' Clubs*, on the ground of their coming home, as it were, to the fireside of the practical farmer, who would not go to an Agricultural Society's dinner; but in their Clubs he said they might meet their neighbors, and talk over in their own plain way all the new improvements which they have themselves adopted, or seen elsewhere.

FARM BUILDINGS.*

THEIR LOCALITY AND CONSTRUCTION.

These, it is quite obvious, should be determined with reference to the objects for which they are designed; and these objects vary according to the climate and staples of the country; while much depends, too, upon the size of the farm. Where capital will admit of it, the better economy would be, however, to adapt them to the full size of the farm, and no more; for although the good manager, the man of sagacity and industry, fond of his business and devoted to his domestic concerns, who begins on a small farm with adequate force or capital, may reasonably expect *to enlarge his estate*, and might venture to plan his Farm Buildings accordingly; yet, in the great majority of instances in our country, farms of more than 300 acres are more apt to be divided than enlarged. This depends, it is true, on the character—we speak of the industrial character—of the owner, and the means at his command. But, especially south of the Chesapeake, land so generally comes into possession encumbered with debt, or with capital and force altogether inadequate to its thorough utilization, that before the debts are paid off and the estate put in good condition, the owner pays the debt of Nature, leaving the wife and children to pay all his other debts.

Again: as to climate and staples, these, too, must have their influence in determining the plan of the Farm Buildings; for clearly what might be suitable and necessary on the small farms in New-England, where a good aggregate annual sale is made up out of notions—a few apples and eggs; a little butter and cheese; a few pounds of wool and feathers; a small nursery of fruit trees; a couple of fat cattle; a few hundred weight of pork, and a variety of odds and ends, for which every farm may find a ready market at a neighboring factory, demands a very different suite of buildings from a farm of much larger size, where the great staples are sheep, or cattle and mules, or hay, or grain, or tobacco, or cotton. But in general it may be laid down that Farm Buildings should be placed and planned with a view to the collection and preparation of the whole produce of the estate, whatever that may be, ready for the market, or for use and consumption on the place—either to sustain or fatten the domestic animals, or as food for the family—and, moreover, and no less important, for the purpose of *collecting, saving and preparing the manure* for the use of the estate in such manner that the full equivalent of all that is taken from the land shall certainly be restored in some equivalent form and substance.

On some former occasion we have remarked on the too common want of system in the arrangement and plan of these buildings, they being, as well as the gathered crops themselves, scattered here and there, without relation to each other, or any plan of economy in the use of them. How often have we seen, for the sake of some momentary convenience, the hay stacked, sometimes on the naked ground, along the sides of the meadow, and the wheat or fodder in like manner in a distant corner of the field—to be moved, load by load, from time to time, as it might be wanted, and wasted on the way, and the broken stack left in the mean time exposed to rain and snow, instead of having it all placed at once where the least possible after-handling and labor would be necessary to place it on the threshing-floor or in the manger.

The farmer should reflect, that it is impossible to handle any thing on his estate but *at some expense!* Time is money, and there is a money value in every five minutes of every machine on his farm, especially animal machines, whether man, horse, or ox.

With inanimate machines, the cost of idle time is less, because they *eat* nothing; but men, women and children, and all other living and consuming beings on the place are sources of *constant* expense; and every fraction of time and of labor, that could be more economically applied, is a proper charge in that account of expense, which every farmer who values his character and his credit, should keep with all the scrupulous punctuality and exactness by which every respectable and intelligent manufacturer and merchant is at any moment enabled to see whether, and how much, he is going ahead or astern. To make every title of labor as *productive* as the nature of things will possibly admit, whether that labor consist in manual, in machine, in water, or in steam power, is the chief, the incessant study of the manufacturer. See how every pursuit except the American farmer's, has been advanced by *steam*. Some man, inspired by a contemplation of its uses and

* For a more minute description of the Farm Buildings illustrated in this No. see end of this article.

its power, makes it pour forth its song of exultation—"the song of steam," in which it boasts of its prowess in all else but in the business of the husbandman. How it travels over mountains, and distances the winds on the trackless and stormy ocean! But what boon does it bring, what service does it render, directly, to the farmer? It does not for him drain the inexhaustibly rich, but useless marshes of the sea-board; neither does it furrow the rootless and stoneless prairies of the West. The Government—our *people's Republican Government*—would give a million of dollars for a steam power that would *kill a thousand men at five miles' distance*, but not a V for a *steam-plow* that should add millions to national wealth and population. That would be *against the Constitution!!* But hear how steam boasts of its contributions to *other* interests—even the Printer's:

In the darksome depths of the fathomless mine
  My tireless arm doth play,
Where the rocks never saw the sun decline,
  Or the dawn of the glorious day,
I bring earth's glittering jewels up
  From the hidden cave below,
And I make the fountain's granite cup
  With a crystal gush overflow.

I blow the bellows, I forge the steel
  In all the shops of trade;
I hammer the ore and turn the wheel
  Where my arms of strength are made;
I manage the furnace, the mill, the mint,
  I carry, I spin, I weave;
And all my doings I put into print
  On every Saturday eve.

Returning to the point of economy in the arrangement of Farm Buildings, it is, as every reader will admit, by no means an uncommon thing to see the farmer's corn-house at a distance of some hundred yards from places where the corn is to be conveyed every day, and every grain of it ultimately consumed. Now, were that a part of the machinery of the manufacturer of flour, or of cloth, or of iron, you would see it so arranged, that between the gathering in the field and the final use of it, one-half of the labor would be saved. Look with what magic-like celerity, quietness, and saving of labor, another grain is managed from the time it leaves the slow and slovenly processes of the farm, and touches the hand of the manufacturer. In the boat, on the wharf, *his* machinery takes up the *wheat*, passes it under the pavement, and without noise or confusion, or the touch of a hand, the beautiful flour is placed in the barrel!

Go into any walk of industry except farming and there you find the same economy of arrangement and of labor—the same ingenious contrivances of mechanical power; the same command over, and subserviency of the elements to give labor a supernatural productiveness. Economy of time and of labor, then, is one of the *great objects* to be studied in the location and adjustment of *farm buildings*—and economy furthermore in the use of the crop in its application to the sustenance and fattening of domestic animals. On this point much is to be accomplished by more or less *warmth* which may be secured by the site and arrangement of the farm-yard. In fact, the principal points to be attended to, are *warmth* which supposes good *shelter*, good dry bedding and pure water and pure air. While the common practice is to let cattle wander over naked fields through the winter months, exhausting their substance by exposure in gleaning, with great exertion, the merest fraction of nourishment, nothing is better understood by all who have given the least attention to the progress of agricultural knowledge than the well ascertained fact that *warmth and food* are in a large degree synonymous.

Writers of the highest authority lay down as *axioms*—that to leave animals to pasture in the *cold* air is to leave them to struggle with the climate for their *existence;* and that, so circumstanced, they can never improve to anything like the extent to which they would improve if properly protected.

And furthermore—that to fatten animals on principles of rational economy, they must be placed in situations, in which they may not only have suitable food, but also *warmth* and *rest;* and that being fattened they should never be fatigued or in any way annoyed, as all fatigue leads to a diminution of fat. On this point of *temperature* LIEBIG is clear and explicit:

"The manifestations of the vital force are dependent on a certain temperature. Neither in a plant nor an animal do vital phenomena occur when the temperature is lowered to a certain extent. The abstraction of heat must be viewed as quite equivalent to a diminution of the vital energy. When the temperature sinks, the vital energy diminishes, (unless supplied with a corresponding excess of food.) Our clothing [or warmth from any cause] is *merely equivalent for a certain amount of food.* The more warmly we are clothed, the less urgent becomes the appetite for food; because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished. If we were to go naked, like certain savages, or if, in hunting or fishing, we were exposed to the same degree of cold as the Samoydes, we should be able with ease to consume 10 lbs. of flesh, and perhaps a dozen tallow candles, as warmly-clad travelers have related with astonishment of these people. We should then also be able to take the same quantity of brandy or train oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the external temperature and that of our bodies. According to the preceding exposition, the quantity of food is regulated by the number of respirations, by the temperature of the air, and by the amount of heat given off to the surrounding medium.

The reader will perceive that we are not undertaking to lay down a *plan* or to indicate the *particular arrangement* of Farm Buildings. All we have had in view here, has been to lay

down the general principle, that economy of labor in preparing the crops for market, and in administering such portions as are to be used on the farm, is to be regarded as a primary consideration. That they should be so constructed, too, as to afford warmth, good bedding, and a full supply of wholesome air and pure water; with the least exhaustion by exposure to cold air and to exercise in which no equivalent sustenance is obtained. Then another point of the highest importance is such arrangements, fixtures, and management, as shall tend to the *greatest accumulation of the best manure.*

Surely the farmers, or at least, we are proud to believe, such farmers as patronize this work, are not now to be reminded of a truth long maintained by Philosophers, that in this world *nothing is lost.* Many things change form, but all are reproduced. If their elements were destructible, the material world would be exhausted. It is the business of the judicious and vigilant farmer to have that reproduction, with what increase of fertilizing matter he can, take place on his own estate—to take care that every particle that his land lends for the support of his crops, shall be returned with interest,—else may he abandon all hopes of improving it. If not restored it would be, in time, as certainly worn out as the material world would itself be if Providence had not taken care that, while every thing is changing form and falling into dissolution, nothing is *extinguished.* One spot catches what is lost by another, and the whole difference between good and bad management consists in the difference between restoring, or not restoring to one's land, those elements of fertility which are so constantly carried off, directly in the form of the corn, hay, straw, grain, tobacco, and other crops, which are sold off the farm, or indirectly, after these same articles have assumed the form of hogs, sheep, horses, cattle, poultry, &c. In explanation of this maxim of ancient philosophy, that nothing is lost, and of the practicability of restoring all to the Farm, hear LIEBIG again:

"One part of the crops employed for fattening sheep and cattle (he observes) is consumed by man as animal food; another part is taken directly as flour, potatoes, greens, vegetables, &c.; a third portion consists of vegetable refuse and straw employed as litter. None of these materials of the soil need be lost. We can, it is obvious, get back in the solid and fluid exuviæ of men and animals, and in the bones, blood, and skin of slaughtered animals, all the constituent ingredients of the consumed food, soluble and insoluble. It depends upon ourselves carefully to collect all these scattered elements, and to restore the disturbed equilibrium of composition in the soil. We can calculate exactly how much, and which of the component parts of the soil we export in a sheep or an ox, in a quarter of barley, wheat or potatoes, and how much we have to supply to restore what is lost to our fields. * * * * * * If the manure supplies an imperfect compensation for this loss, the fertility of a field or of a country decreases; if, on the contrary, more is given to the fields, their fertility increases. An importation of urine or of solid exuviæ from a foreign country is equivalent to an importation of grain and cattle; for in a certain time the elements of those substances assume the form of grain or of fodder, then become flesh and bones, enter into the human body, and return again, day by day, to the form they originally possessed. The only real loss of elements we are unable to prevent is of the phosphates; and these, in accordance with the customs of all modern nations, are deposited in the grave. For the rest, every part of that enormous quantity of food which a man consumes during his lifetime, (say in sixty or seventy years,) and which was derived from the fields, can be returned to them. We know, with absolute certainty, that in the blood of a young or growing animal there remains a certain quantity of the phosphate of lime, and of the alkaline phosphates, to be stored up and minister to the growth of the bones and general bulk of the body; but that, with the exception of this very small quantity, we receive back, in the solid and fluid excrements, all the salts and alkaline bases, all the phosphate of lime and magnesia, and consequently all the inorganic elements which the animal consumes in its food; and what is not thus directly given back, the air takes up and gives back.

As to the arrangements of the barn-yard with an eye to the *preservation of manure.* Although we are fully impressed with the value of every quart of liquid manure, and think it a just subject of reproach to every farmer who loses one drop that he can save, we have our doubts about the expediency of building *tanks*, for the use of ordinary farmers. Doubtless it would be very desirable, and ought to be provided for by those who have the means; but we apprehend there must be much expense in the beginning and more labor in lifting and spreading than most farmers in this country can afford.

On the subject of manure, its management and preservation, we think the considerations in the following extract are worthy of all attention:

"For the successful preparation of this indispensable material without waste, all are agreed that it should be protected from the weather, and that all the animal excrements, liquid and solid, should be preserved in it. For this purpose, again, a covered area seems much better adapted than open yards in which the sun, wind, and rain, rob the farmer of many a pound in the course of the year. On the contrary, where the liquid manure is conveyed to a proper receptacle by underground drains, and the solid parts are constantly carried to a proper spot which is covered over, no loss of valuable matter is sustained. The system of running the liquid manure into underground tanks has been much recommended, but when collected in these it requires much labor to pump it out again, and mix it with some porous material, such as dry earth, ashes, dung, &c.; besides the outlay in forming the tanks, and the wear and tear of pumps constantly liable to corrode and become choked. Hence it appears to me, that the best arrangement would be to secure such a fall from the cattle sheds,

stables, piggery, &c., that the liquid manure should deliver itself above the top of the heap of dung, compost, weeds, &c., which should be placed ready to absorb the liquid manure in a receptacle hollowed out and prepared for the purpose, and roofed over."

To evince our estimate of the importance of this subject, and that the Publishers of this journal in their liberality, restrain us in *nothing which may be deemed useful to its patrons*, the plan of Mr. Wilkinson's barn, and appendages, has been illustrated. We understand it has met the approbation of the State Society, but we offer it to speak for itself.

Those, if any, who think it deficient in principle or details, will soon have an opportunity of displaying their taste in attempts at a better one. *We are authorized by the Publishers of the* FARMERS' LIBRARY *and* MONTHLY JOURNAL OF AGRICULTURE *to offer a piece of plate (value $33) with suitable inscriptions, for the best plan, with all the requisite drawings for a Farm House and Buildings, to be adapted to the Eastern, the Middle and the Southern portions and products of the Union.* This general notice may suffice until, in the next number, a more particular specification may be given.

They will offer, also, a handsome piece of plate of like value for the best essay on the Natural History of the Tobacco plant and its entomological enemies, to be accompanied with a drawing and a dissertation on the culture and curing of the plant. The same as to *Hemp, Hops, Rice and the Sugar-Cane.*

DESCRIPTION OF WILKINSON'S PLAN OF FARM-BARN, SHED, &c.

[*See Diagram at the commencement of this Number.*]

Fig. 1. Elevated View.
Fig. 2. Plan of Lower Floor.
Fig. 3. Plan of Upper Floor.

DESCRIPTION OF FIRST FLOOR, FIG. 2.

First Floor.—A, The North Shed, 26 by 80 feet. 1, 1, 1, An Alley 5 feet wide, leading from the basement of the barn to the cattle stable. 2, A Straw Bay, 21 by 18 feet, open to the threshing and cleaning floor and barn-yard through the door A. 3, 3, 3, &c. Cattle-Stalls, 5 by 11 feet, separated by double partitions, with a door the whole width of each. 4, A space 12 by 21 feet, with high half-doors, in which to drive with leads of hay to fill the loft over the cattle stable; likewise to be used as a Calf-Pen; having nearly its whole area exposed to the sun, when the upper doors are open. 5, 5, Open Shed, containing 480 square feet. 6, 6, 6, &c. Box-Mangers for hay, 2 by 3 feet 7, 7, 7, &c. Boxes for roots and grain, 2 by 2 feet.

B, The Ground Floor of the Barn. 1, Grain Cleaning floor, 22 by 30 feet. 2, Granary. 3, Vegetable Cellar, 18 by 22 feet; with three trap-doors in the second floor over it into which to tip the roots or vegetables in separate bins. 4. Cistern, 12 by 16 feet, from which the water is drawn by a two-inch iron pipe running through the east wall of the cistern and the siding of the barn, the outlet of which is about 18 inches from the ground by the side of the barn where it falls into a large trough for watering the cattle in the yard, or the water might be conveyed by means of a pipe to all the stalls of the stables if preferred. The water escapes by lifting a valve perpendicularly off from the end of the pipe by means of a cord running to various parts of the barn, in order that the water can be drawn from the cistern at any time from any part of the barn. The bottom of the cistern is a little above the floors of the basement, so as to have but one pipe to draw off all the water when the cistern is to be cleaned. The pipe is laid in the current in the bottom of the cistern until it reaches the lowest place in the bottom, where it has a right-angle elbow; thence running perpendicular to the surface of the bottom, where the end of pipe is squared or trued by filing, so that a leathered leaden valve will make a water joint. 5, Hall, 4 by 16 feet. 6, Carriage House, 27 by 30 feet. 7, Stairs leading from cleaning to threshing floor. 8, Stairs from lower hall to second floor.

C, The East Shed, 26 by 62. 1, 1, Alley leading from barn-yard to front of cattle stalls. 2, 2, 2, &c. Cattle-Stalls, 5 by 11 feet, with door the whole width of the stalls. 3, 3, 3, &c. Box-Mangers for cattle, 2 by 3 feet. 4, Boxes for roots and grain, 2 by 2 feet. 5, Open Shed, containing 350 square feet. 6, Entrance to *Henery.* 7, Stairs, 3 feet wide, leading from carriage house and stable to the Hay Loft. 8, Entrance to Harness Closet under the stairs. 9, Platform to place the measure on, under a leader from the grain bin in the hay loft. 10, 10, 10, &c. Horse Stalls, 6 feet wide, with semi-circular racks for hay. 11, Horse Stalls, and house for lumber wagon only. 12, Doors by which to enter from either way with a wagon, or to drive through. 13, Trap-Door to Vault for horse manure.

DESCRIPTION OF THE SECOND OR UPPER FLOOR, FIG. 3.

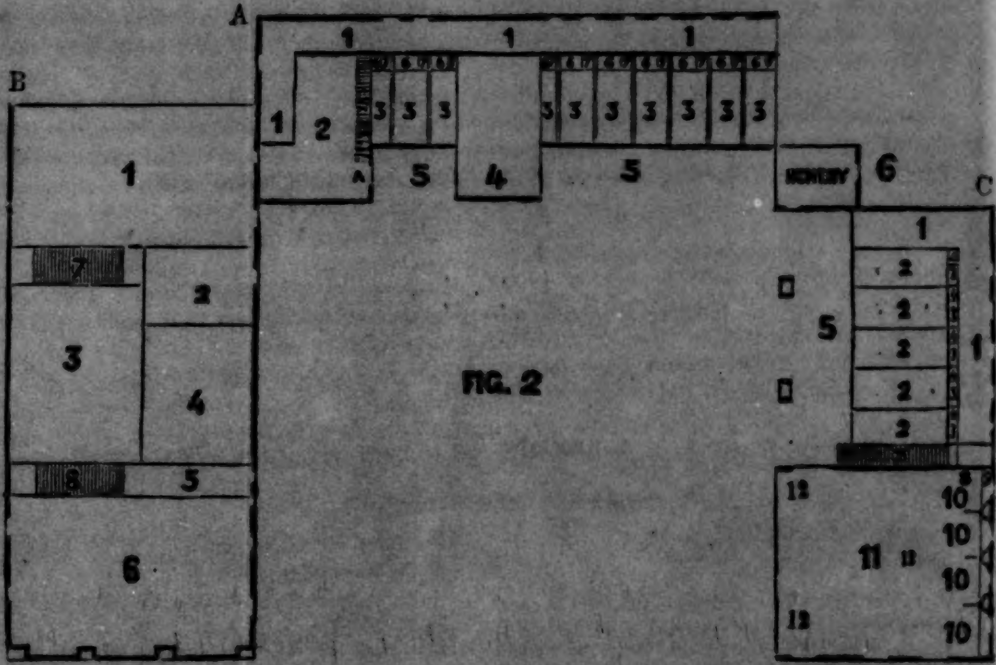
A, The North Shed. Æ, A door through which to throw the straw from the threshing floor 2 into the Straw Bay. B, Landing of stairs from the Straw Bay to Hay Loft. C, An open space that may be used for mow room, after the shed is filled, by placing poles across from mow to mow. It may be filled from the upper half-doors G.

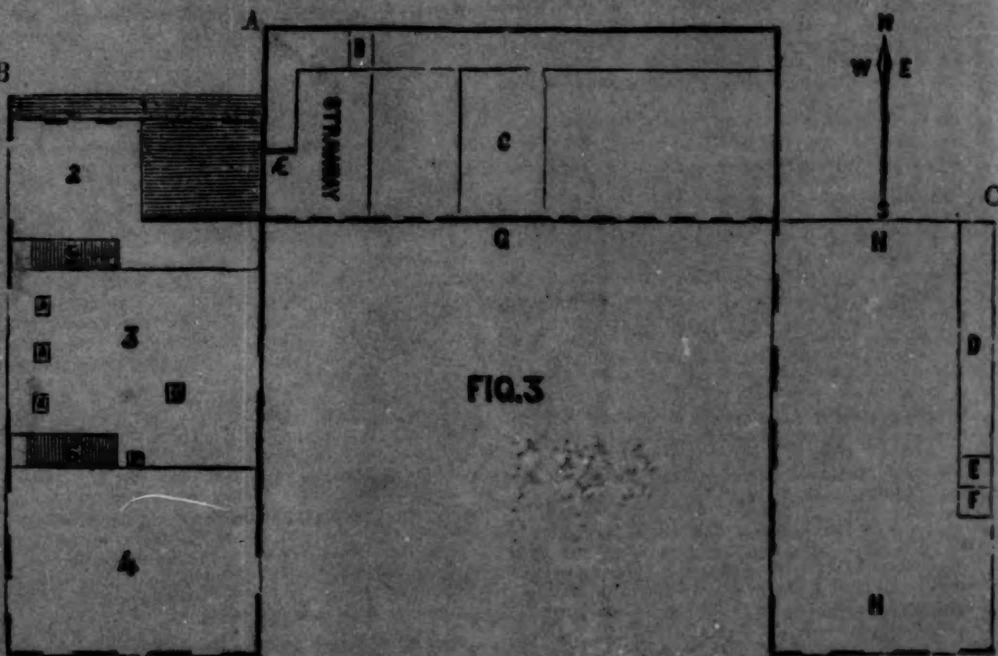
B, The Barn. 1. Crib Floor, 3 by 30 feet. 2. The Threshing, grated cleaning floor, 22 by 30 feet. 3, Grain and Hay floor, 27 by 30 feet. 4. Mow, 27 by 30 feet. 5 and 6, Stairs leading to the lower floor. A, A, A, Trap-Doors over Vegetable Cellar. C, Trap-Door to enter the Cistern. E, Trap-Door over the lower hall. The object of this trap-door is to drop the fodder from the barn floor, or large mow over carriage house, into the lower hall, to be foddered in the yard without exposing it to be trodden under foot by the cattle in the yard. This floor is on a level with the ground on its western entrance.

C, The East Shed. D, An open space, the same as in the north shed. E, The landing of the Stairs from the wagon house and stable below. F, Oat-Bin in the hay-loft. H, H, Hay-Loft, 26 by 62 feet.

WILKINSON'S PLAN OF A BARN, SHED, &C.

For a Description see page 328 of Monthly Journal of Agriculture.





THE MODE IN WHICH LIME OPERATES

IN RENDERING THE SOIL BETTER ADAPTED FOR THE GERMINATION AND GROWTH OF PARTICULAR PLANTS.

BY ROBERT M'TURK, ESQ., OF HASTINGS HALL, DUMFRIESSHIRE.

[Premium, the Silver Medal.]

[A FAVORITE practice in Maryland, where clover is much relied on for restoring worn-out lands, and for maintaining the strength of such as have been recruited, is to sow the clover-seed on the snow, in February, and leave it without any covering except what it gets by sinking into the ground, on the melting of the snow and the alternate thawing and freezing in spring—otherwise it is sowed, in like manner, on the surface, later in spring, but generally before the cessation of frost. Sometimes, as was the case last spring, the young clover is killed by a severe frost occuring just when the young clover is coming up, but generally this system of sowing appears to answer well. It is usually on the young wheat or oats—harrowing is sometimes resorted to but very rarely. Where the land is light it is deemed advisable to roll the clover-seed which may serve to give more compactness to that sort of land, liable as the young grain crop is to be injured by the March winds. It would seem clear from the experiments here detailed, that covering the seed is not necessary to its germination, and that when it is done, it cannot be done too lightly.]

THERE is no substance, perhaps, so extensively used for agricultural purposes, with regard to whose agency, and the time of applying it to the soil, the opinions of practical men have differed so widely as that of Lime; for, while it has been, and, I may say, is at the present time, regarded by one class of agriculturists as a manure, it is by another, and, perhaps, not the worst-informed class, regarded merely as a stimulant; that of itself it contributes almost nothing to the growth of plants, and that the benefit resulting from the application of it to the soil is owing entirely to the action which it exerts upon other bodies which it encounters in the soil. It would not be difficult to show that lime, like the other earthy bodies, enters so sparingly into the constitution of plants, that its presence, in many whose growth it promotes, can, upon analysis, with difficulty be detected, and we are, therefore, entitled, perhaps, to regard its presence, on some occasions, as accidental rather than as a necessary constituent.—Were Lime really entitled to be regarded as a manure, we are inclined to think that its effects would be less evident than they really are, especially when we take into consideration the very small proportion in which it is found to exist in those plants which are considered as most worthy of cultivation, and for promoting the growth of which it is most frequently applied. To what, then, are we to attribute the increased fertility of these soils which have received a due proportion of Lime? Most certainly not to the influence which it exerts over the earthy bodies which constitute the soil, these being saturated metallic oxides, which have no affinity for it. Nor has Lime an affinity for any of the elements which they contain; and, if the soil did not contain other ingredients, upon which it powerfully acts, its application would be followed by no beneficial results. These ingredients are the remains of bodies which have lived and died, and still, in some degree, retain their organization; and, in proportion to the quantity of decomposable matter which they contain, and the causticity of the Lime when applied to them, will be the effect produced. If, then, the action produced by the Lime depends so much upon the state in which it is applied, it is also proper that we should mention that its causticity depends, *first*, upon the freeness from other earthy matters, or, in other words, its purity; and, *secondly*, on the time that is allowed to elapse between the burning and the application; the burning being simply the means by which the carbonic acid is expelled, and the Lime being thereby changed from a mild to a caustic state, or, as it is called, quick-lime. Water is then applied, for the purpose of slaking or pulverizing it, in order that its distribution over the land may be more equal, and effected with greater facility. But, from the time it is cooled, after it comes from the kiln, its affinity for carbonic acid gas is very strong, and it will continue to attract it from the atmosphere till it is again united to a proportion equal to what was expelled by the operation of burning; and if this is allowed to take place before it is applied to the soil, it returns to a state comparatively inactive, and, in proportion as it has been allowed time, and placed under circumstances favorable for attracting carbonic acid gas, it will lose the power of acting upon, or disorganizing the animal or vegetable remains which it encounters in the soil, and also of neutralizing any acidulous matter which may there exist.

We shall now endeavor to explain the nature of the action which Lime exerts upon the organized matter it encounters in the soil, and in what manner this action tends to promote the generation and growth of particular vegetables.

When a plant dies, it leaves its roots in the soil; and the roots of some plants occupy a much larger space than a person unacquainted with their growth may suppose. The softer and more juicy parts begin to rot or to be de-

composed—which, in fact, is the loosening of that mysterious influence by which the elements of all organized bodies are held together as long as life endures; and the process of decomposition of any animal or vegetable substance is, therefore, simply the restoring to nature those substances, in their elementary forms, which it at first received from *the soil or atmosphere*—and this process goes on with more or less rapidity according to the nature of the substance, and the circumstances under which it is placed. Although it is a well-established fact that putrefactive fermentation, or the process of decomposition, cannot take place unless in a temperature of above 32° Fahrenheit, a free admission of the atmosphere, and a certain degree of moisture; still these agents are always present in the soil, within a moderate depth from the surface, and under circumstances sufficiently favorable to effect the decomposition of the softer and more juicy parts of animal and vegetable substances; but when their decomposition has taken place, the more solid parts still remain, and these, with the yearly contribution afforded by the more recent plants, constitute an inexhaustible source of organized matter from which, by well-directed skill and industry, man may derive his means of subsistence. In this beautiful provision of nature, we find that, when man commits to the earth the remains of animal or vegetable bodies, he not only secures a present nourishment to crops which supply his own immediate wants, n the more decomposable parts of those remains, but has also laid up a bountiful store for those of his race who will take his place on earth when his labors are over. Lime, then, is an agent which enables us to avail ourselves of the hidden stores of nourishment which the soil contains; for, when it is applied to the soil in its caustic state, it is washed in by showers of rain, and, in its progress through the soil, encounters a portion of inert, insoluble, but decomposable matter, which it acts upon in such a manner as to effect its decomposition, and resolve it into three parts essentially different in their nature and character, all which parts are contained in the smallest portion that can be decomposed—*first*, the gaseous; *second*, the soluble; and, *third*, the residuary matter. It is the two first of these we are to regard as the immediate cause of the increased fitness of the soil for the germination and growth of particular plants.

First, then, with regard to the germination of particular seeds, and there is none with regard to which it is more remarkably the case than that of white clover, and at the same time, there is no plant more desirable to be obtained.—When Lime is applied to the surface of pasture land of so inferior quality that clover has not before made its appearance, and, if the land is not so wet as to counteract the influence of the Lime in the course of the second year after its application, white clover is almost certain to appear. It is evident from this that the seeds of the clover must have been in the land before it was limed, as the calcination of the Lime completely precludes the possibility of the Lime itself being the medium through which they have been conveyed. How long the seeds may have lain there, without their vital principle being destroyed, we have no data to form an estimate; but we know they must have been there from a very remote period, and their coat must be of a very impervious nature, to have prevented germination, and to have protected it so long from injury; for germination, like decomposition, requires a certain temperature, and the seed to be in contact with moisture and the atmosphere; and the rapidity of the process, in these circumstances, depends upon the temperature, so long as it does not exceed 100° of Fahrenheit.—When Lime, then, commences its action upon decomposable matter, a portion of gas is disengaged, which penetrates the soil above it, and is partly absorbed by the soil, and partly makes its escape to the atmosphere; and, as decomposition proceeds, the soil becomes looser and more permeable to the atmosphere. The temperature is, at the same time, increased by the more ready admission of the sun's rays, while the heat, which is always evolved in the process of putrefaction, stimulates the seed to absorb moisture, and, at the same time, oxygen from the atmosphere, which now finds ready admission through the now permeable soil. The germination of the seed is thus effected which had lain for ages in the soil, and might have continued so for ages to come, had the action of Lime on the decomposable matter not rendered the superincumbent soil porous, by which the atmosphere was admitted, and the oxygen, its vivifying principle, absorbed, and the temperature raised by the ready admission of the sun's rays, and the heat evolved during decomposition.

The next point for consideration is the manner in which Lime promotes the growth of particular plants. Although the seeds of some plants are covered with a coating so impervious to moisture and the atmosphere as, when buried in the consolidated earth, germination cannot take place without the agency of some powerful stimulant, such as Lime, still we are acquainted with no plant of which it does not in some degree promote the growth. It is true that, when applied to land, some of the plants which before occupied the surface disappear, but it is doubtful whether this arises from anything in the Lime which is deleterious to such plants, or whether its action has so powerfully promoted the growth of others, that their increased luxuriance proves fatal to those of weaker character; and, if pasture is allowed to become too tall and rank for two or three summers together, the white clover, which indicated the improvement of the land, is choked, and, the action of the Lime having subsided, the germination of other seeds of the same plant does not take place.

When gaseous matter is disengaged by the action of Lime, the matter to which it has united itself is partially rendered soluble in water; and it is a truth, which requires no illustration, that no substance of any kind can be received as nourishment by plants which has not, in the first instance, been dissolved in water, the mouths of the roots being so very small as not to admit the point of the finest needle. It farther seems to be a law of nature that organized substances cannot again form part of a living being without being in the first place disorganized; and in proportion to the quantity of the inert matter which the Lime has acted upon and rendered soluble, and also in proportion to the gaseous matter which has been evolved during the process, and been absorbed by the soil, will be the amount of nourishment or advantage resulting from the application of Lime. Although we have selected clover as the plant, the germination of which frequently follows the use of Lime, there are others over which it exerts an equal influence; but as its appearance is the surest indication of an important change having taken place in the soil, whether the Lime had been ap-

plied to improve the pasturage or to enrich the soil for the cultivation of other crops, the appearance of other plants is often overlooked, and some do not germinate till after the land is plowed and placed under more favorable circumstances, of which class of plants the dead nettle furnishes a good example.

There is another argument which we may advance, in support of this view of the germination and growth of clover, arising from the influence of draining. Where this improvement has been sufficiently made, so as to effect an amelioration of the soil, white clover is sure to make its appearance. This is owing exactly to the same change in the soil, in consequence of drainage, which we have ascribed to the Lime; for when superabundant moisture is withdrawn, plants of a semi-aquatic nature die, and others, more suited to the altered nature of the soil, take their place, and the atmosphere and sun's rays are permitted to penetrate with facility the space which the water had occupied. The necessary agents for promoting decomposition are then present, and the process first commences among the partially decomposed remains of vegetables which have perhaps died many years before, and it matters not whether their decomposition has been brought about by the action of Lime or the influence of draining. Seeds of difficult germination, existing in the soil, are placed under the same favorable circumstances as with Lime; for the oxygen absorbed by the seeds during the process converts the farinaceous matter which they contain into sugar, and the roots of the infant plant are supplied with it till it possesses strength to take hold of the soil, and to appropriate to itself a portion of the soluble matter which the process we have described had formed in the soil.

The Marquis of Tweeddale stated, at the Society's meeting at Berwick, that Lime seemed to be injurious to crops on land that had been drained. The noble Marquis did not state in what respect the crops were injured in consequence of the Lime; but it appeared to us not less evident than if his Lordship had stated it in explicit terms, that the injury could only have arisen from one of two causes, namely, from too violent action excited by the united influences of draining and liming a soil containing much decomposable matter; and the consequent evolution, too, of much gaseous matter, in its ascent to the surface, had loosened or *heaved* the soil, that the seed was thrown out or the plant rendered so loose as to become incapable of nourishing itself in the slightest drouth. This is one way in which Lime might prove injurious to drained land; but there is another we have frequently witnessed in the *lodging* of the crop before the ear is filled, from the luxuriance arising from excess of soluble matter excited by the united agencies of liming and draining.

We shall now mention some of the experiments which we made in the course of the season, which tend to illustrate and confirm the statements here advanced as to the causes of the appearance of white clover when Lime is applied. On the 12th May, 1841, we had a piece of land, well dug and cleaned, divided into nine parts, by means of pins driven into the ground, and division-boards nailed to them to keep them firm in their places. The use of the division boards was not only to divide the portions of ground separately, but also when the ground was leveled within them the exact depth of earth in each division might be measured.

No. 1. Six feet square; the clover seed sown on the surface.

No. 2. Ditto; the clover seed raked in gently.

No. 3. Ditto, half an inch of cover.

No. 4. Ditto; six-eighths of cover, one-half of the division compressed by treading, and afterwards smoothed

No. 5. Ditto; one inch of cover, and the other half compressed.

No. 6. Ditto; one inch and a quarter of cover, the other half compressed and smoothed.

No. 7. Ditto; one inch and a half of cover, the other half compressed and smoothed.

No. 8. Ditto; two inches of cover, one half compressed and smoothed.

No. 9. Ditto; two inches and a half of cover, one half compressed and smoothed like the rest.

After the one half of the divisions, Nos. 4, 5, 6, 7, 8 and 9, were compressed by treading upon them, and smoothing them with the back of a spade, the one-half of each of the nine divisions in the opposite direction received an ordinary liming. The weather, for some time after the 12th, was mild, and sufficiently moist to forward germination. Nos. 1, 2 and 3, were in an active state of germination on the 19th day of the month; No. 4 on the 21st, and the compressed division not till the 25th; No. 5 on the 24th, and the compressed and limed division not till the 1st of June, the other sometime afterwards; No. 6 germinated only on the limed divisions; the uncompressed about the middle, and towards the end of June; No. 7 exhibited, at this time, no appearance of clover, and afterwards a few plants appeared on the limed divisions, some time after the removal of the weeds which had germinated upon it; and this operation, no doubt, promoted both the action of the Lime and the germination of the seeds, by allowing the air more ready access to those parts from which the roots had been extracted; and also, not improbably, by bringing some of the clover seeds nearer the surface. On Nos. 8 and 9 we had no clover plants in the course of the season. On Nos. 1, 2, 3 and 4, we could observe no difference on account of the Lime, though applied in a hot or caustic state; and the reason we conceive why it had no influence on these divisions was, because they were placed under circumstances so favorable to germination that it was effected before the action of the Lime commenced; and that on Nos. 5, 6 and 7, which were under circumstances less favorable, the germination did not take place till stimulated by the action of the Lime; and whether it will have any influence on Nos. 8 and 9, next summer will show.

The practical inference we would draw from these experiments, in the first place, is this—Is the present system of sowing clover calculated to promote germination? We have no hesitation in saying that it is precisely the reverse; for, when sown with rye grass seed and harrowed in, in the usual way, it cannot fail to be too deeply covered, and the consequence of the rolling, which is now a general practice, must also increase the evil. It is, perhaps, from this cause that we always see the best braird of clover on the hard and gravelly parts of the field, and we therefore conclude that that is the land best suited for its growth, when, in fact, we are inclined to think that, under the present system of sowing, harrowing, and rolling, it is only the best adapted for the germination of the seed from its more permeable nature. It might be worthy of investigation to ascertain how far the present system of management will account for the falling off of the crops of red clover, which has been experienced for some years back; for

the germination of the seed of this plant requires circumstances not less favorable than that of the white. To ascertain this point, it would only require to be sown by itself, after the rye-grass is harrowed in, and might be tried either with or without rolling.

There is another practical application that may also be drawn from the view we have advanced regarding the action of Lime upon decomposable matter. We have imputed to this action nearly the whole benefit resulting to the crop from its application. If this view is well founded, it must follow that its application to land which naturally contains but little, or which has been exhausted of its decomposable matter by overcropping, or otherwise, (for much plowing, by exposing the soil to the action of the atmosphere, also tends to decompose animal or vegetable matter, and the crops to exhaust it,) can be attended with little or no advantage, and it is from this cause that the first application of lime is always attended with the best effect from the undiminished accumulation of this matter in the soil. The application of dung or any other manure to the soil, to use a familiar illustration, is like giving a feed of corn to a horse—it tends to strengthen and nourish; while Lime may be regarded as the application of the whip or spur—it imparts no new strength, but stimulates into action the power which previously existed.

[Trans. of the Highland and Agri. Soc. of Scotland.

THE HOUSEWIFE'S DEPARTMENT.

POULTRY, AND USEFUL RECIPES.

"To me more dear, congenial to my heart,
One native charm, than all the gloss of art;
Spontaneous joys, where Nature has its play,
The soul adopts, and owns their first-born sway;
Lightly they frolic o'er the vacant mind,
Unenvied, unmolested, unconfined."

It is said by naturalists, and by old women from whom naturalists and philosophers have learned much of all they know, that, hatch the egg of a wild turkey where you may, and rear the young as you may, neither art nor time can ever thoroughly extinguish its instinctive longing for the wood. To its shades and its privacy its inclinations ever point as the needle to the pole. Thus it is with the man who has been *reared in the country!*—he can never be cured of his predilection for scenes where first he set his traps, or chased the timid hare to his last forlorn hope of safety in the ground or hollow tree. His profession or business—the best use of his faculties for the support of his family—may impose a forced residence in a city. Sometimes it may happen that ample fortune may open the "world before him where to choose," and his heart may yearn for the open air and active exercises of rural life—yet the vanity, the caprice, the indolence and frivolity of an ambitious wife, may drag him to take up his abode in a large town, that she may the better enjoy its ease, its gayety, and all its luxurious and sensual indulgences. If, in this case, without training or necessity for business, he happen unfortunately to have no turn for literature, after sighing in vain for the physical excitements and occupations of the country, which might supply to him the place of books, he becomes wearied of existence, and so betakes himself to the dice-box or the bottle—ways ever open for escape from *ennui and from life.*

"But the long pomp, the midnight masquerade,
With all the freaks of wanton wealth arrayed
In these, ere triflers half their wish obtain,
The toiling pleasure sickens into pain;
And, e'en while Fashion's brightest arts decoy,
The heart, distrusting, asks if this be joy?

Thus it sometimes happens that a large fortune, which was the fruit of a long career of parental industry, and fondly designed as a blessing for the son, is turned into a curse by the folly of a wayward, ill-trained woman.

Not only with the country, but with the *women's department* in the country, are all a man's earliest and most grateful recollections associated! How, gentle reader, should it be otherwise? Was it not there that his heart first swelled with the spirit of rivalry and ambition, in plays at ball and bandy? that it first exulted in the pride of property, when mounted on his pet pony, Button or Taff, and *his own new* saddle and bridle? And, then, his gun and shot-bag, and home-made powder-horn, scraped into transparency with pieces of glass bottle! And, again, *who,* we pray you, carried the keys of the old closet under the stairs—that venerated repository of so many good *nugs:* sugar—molasses—preserves—ginger-cakes—almonds—raisins

—cheese? And who was it that skimmed, and skimmed lightly, on purpose to *leave* a skim of cream on the top of the *pan of bonnyclabber?* and sometimes slyly sugared o'er your buttered bread? Who let the urchin roast, without seeming to see it, in one corner of the kitchen fire, the egg stolen from some straggling nest found in the barn or under the bush? Who, when glorious *Saturday*—ever most beloved of schoolboys—came round, sewed the sheep-skin cover on his trap-ball, and gave him cotton to twist into a fishing-line, and twine to set and apple to bait his snare? And then, above all, who was it you relied on, of a doubtful "week-day" morning, when clouds were lowering in the north-west, to persuade the old gentleman that the children had better stay at home and "get their books" to-day—which you, and she, too, very well knew meant, virtually, to do anything else but that? Oh Woman! thy name is kindness, and in thine heart is the temple of charity! Lives there a man with heart not alive with remembrance of your good and tender offices?—

"Oh bear him to some distant shore,
Some solitary cell,
Where none but savage monsters roar,
Where Love ne'er deigns to dwell!"

But, back to our theme.

Sooner than we had promised or expected, we find ourselves under obligation to reöpen the Housewife's Department, for the sake of supplying some items immediately connected with what was given, under that head, in our last, and which are necessary to fill out what was there commenced—for, on review of it, we find it deals a little too much in the natural history of Poultry, and wears rather more the aspect of a literary article than one on *practical Housewifery*. So we return to it with a view to speak more in a common-sense way of *fowls*—their *food*, their *eggs*, and their *feathers;* and as Scripture saith the first shall be last, and the last first, we will begin with *feathers*.

Being a little rusty in our youthful reminiscences of Poultry management, we wrote—if we must tell the whole truth—to an old maiden sister, still left to us by a kind Providence, as the guide and the oracle, among her friends, in all that she pretends to know. She was nurtured in the strict principles of the old school, and would have practiced them from Nature, "any how"—direct, plain-spoken, and religious—one of those who, as the Scotch proverb says,

"Wears like a horse-shoe—the langer the brighter."

but she will be sure to scold us, if ever she catches us, for *putting her in the papers!*

From her we received the following, in answer to our inquiries, and which we transcribe nearly to the letter:

FEATHERS.—As I have experimented and found out a fact, that every housewife should know, and as I wish to be useful the little time I have to live, I should like it to be well known, that *feathers*, smelling ever so badly, may be restored to perfect freshness, by washing them clean [in soap suds] and letting them lie a day and a night in *lime water*, about as strong as we drink it, medicinally. They should then be dried as soon as possible in the air, or by a fire. It is not known what a quantity of dirt there is in very nice looking feathers. But it is not the dirt that makes them smell, so much as the *pen*, or *unripe* feathers. And here let us pause to ask if there be in nature any thing more beautiful—if it were not so common—than a barn-door fowl strutting in the splendor of his plumage, and the pride of his dominion, for which he is ever ready to battle with life? Every single feather, the eloquent Pailey observes, is a mechanical wonder. "Their disposition all inclined backward; the down about the stem, the overlapping of their tips, their different configuration in different parts, not to mention the variety of their colors, constitute a vestment for the body so beautiful and so appropriate to the life which the animal is to lead, as that I think we should have had no conception of any thing equally perfect, if we had never seen it, or can now imagine anything more so." For the curiosity and observation of those to whom this department is dedicated, we give some of the laws which according to naturalists *regulate the varieties and changes of plumage*. To us some of them are new, and the observation of them may well form a part of that variety of study and amusement, which is to be found, for an active mind in every walk of rural life. That eminent patriot and farmer, the late "Col. JOHN TAYLOR of Caroline," Va., took great pleasure in feeding his pigeons and his Poultry with as much regularity as he took his own meals.

ZOOLOGY, as every one knows, is the science of animals. That is, it teaches their nature and properties, their classification and their order of succession upon, and their distribution over the earth. In Zoology what relates to the *plumage of birds*, is called *Indumentum*, from the Latin word, *Induo*, I put on—and the laws of plumage are, that it is generally more than once changed, be ore it attains that state which is characteristic of the fully mature bird. The period during which these mutations are proceeding, varies from one to five years, and many birds rear a progeny before they acquire the plumage of maturity. When the *indumentum* of the male bird differs in color from that of the female, the young birds of both sexes resemble the latter in their first plumage. But when both the adult male and female are of the same color, the young have then a plumage peculiar to themselves. In some species the adult birds have

a plumage during the breeding season, decidedly different in color, from that which they bear in winter; in these cases the young birds differ in color from both parents, and have a plumage which is intermediate in its general tone, to that of the two periodical states of the parent birds, and bearing indications of the colors, to be afterwards attained at either period.

The changes in the color of the plumage of birds are effected either by a total moult of the old and acquisition of new feathers, or by a partial moult and the admixture of new feathers with a certain portion of the previous plumage; or on the birds obtaining a certain number of new feathers, without shedding any of the old ones; or, lastly, by the fully formed feather itself becoming altered in color: the last two changes take place in the adult birds at the approach of the breeding season. The change of color of a fully developed feather is produced, either mechanically, by the wearing away of the lighter colored tips, which exposes the brighter colors of the plumage beneath, or by some internal chemical or vital influence upon the coloring matter of the feather itself. The latter change begins at that part of the web nearest the body of the bird, and gradually extends outward till it pervades the whole feather.

So much for *feathers*. We return to the letter from our good old sister. What she says is always in a plain, common-sense way, and for every-day use. *The raising of Poultry*, she adds, is no trouble, compared to keeping them from *rats*, particularly where there is an *Ice-House*. There was never but one rat seen here, until we got an ice-house; now they devour chickens on one side of the house, while on the other we are ruined by *minks*—and *hawks* all over the plantation! There are so many ways to treat Poultry that it is impossible to know, exactly, the best.

J. H. W. keeps the old hens up (in coops) from the time the chickens are hatched until they are fit to eat; and a most excellent way it is, but I think it too great a punishment. If I had my choice, I would raise ducks, both sorts, and chickens, with old turkey hens. True, they take them away from the house, but then they travel so slow, so gentle, that it suits much better.

Food.—For young chickens nothing is better than *Indian corn dough*, until they can eat corn or the refuse of wheat. They will eat the latter in a few days, and small-grain corn in less than three weeks. The sooner they get to eat grain the better.

Muscovy and Puddle Ducks.—These differ very much in their habits, but will do to *feed together*. Both should always have access to water, particularly in very hot weather. They require a place where they can *cool their feet*. I prefer a pond, if running water is not convenient. I have seen their feet parched with the heat of the ground.

Food for Ducks.—Wet meal or wheat bran for a week or two, kept in a coop or place that they can go to at pleasure. After some time, a *rich wash*, made of any kind of vegetables—nothing better than *parsley*, thickened with the husks of Indian meal. It will not do to keep both sorts of ducks for breeding on the same dung-hill.

Turkeys.—These should not be disturbed by any means, *while they are hatching;* and if they could be set to hatch so far apart as not to hear each other's young, it would be better. Some people have the nests so fixed that the old ones can't leave them while they are hatching.

Food for Turkeys.—The first thing is a *grain of pepper* to each—see that they swallow it; then corn-meal wet. After a few days, a spoonfull of *tobacco seed* put in victuals for thirty turkeys for the day. This may be done every day, if convenient, and now and then about a *tea-spoonfull of copperas*, say three times a week, in the evening. One great point is to keep them clear of *lice* (you may call them what you will!) The only thing to do that is *soft grease*, in dry weather; but there should be great care used so as not to make them too greasy. Lately a more certain remedy has been found: it is *fishberry*, steeped in whisky, sold by the apothecaries. But after being raised, there is a most fatal disease for turkeys, which attends them soon after going into the *tobacco fields*. They are taken with a *choking;* seem to draw their necks down, as it were, into their craws, and then discharge from their mouths the greatest quantity of matter of the most shocking odor. Out of forty, large enough to eat, we saved but seven. We think that was done by giving them lard—a piece as large as a nutmeg. When first taken twice will be enough to give it.

Now I think you must want something to put in your paper if you put in it this nonsense, with the exception of the *cure for bed-feathers*.

Now, verily, good sister, we think very differently, and so we opine, will our readers. But that which relates to the disease which befals the turkey after being turned into the tobacco field, requires a note of explanation for housewives who do not abide in the region of that precious weed! Be it known, then, that where tobacco is grown, turkeys are raised, or if not raised, bought, for the express purpose of being driven through the day, except in the very hottest part of it, through the tobacco fields, *to destroy the worms* that infest, and sometimes make dreadful ravages on the crop. You will see the old turkeys, attended by the young gang, take each its row. and go marching quietly

along, as if stepping to the tune of the dead march in Saul, examining each plant critically as they proceed, and devouring the smallest speck of a worm. But for these armies of turkeys, so employed, the crop of tobacco in Maryland would be very materially shortened every year.

In that State, planters whose wives are not smart enough to have the requisite number raised, or who, as most frequently happens, are denied *the necessary houses and fixtures and help to do it*, buy from poor people—often from poor widows—giving, though with very unbecoming hesitation and reluctance, as much as 50 cents each, when they are as large as partridges (which in New-York they call quail, calling *pheasants* partridges), at which time they are considered past the "vicissitudes of youth," and *out of danger*.

When the tobacco crop is housed, the turkey has performed the good office for which he was chiefly reared or bought; and having saved by his services three times what the poor widow got for it, the planter sends the surplus of the gang to Washington to be sold, generally, for double what he so reluctantly gave, most generally to another poor widow, keeper of a boarding-house to be devoured by Members of Congress, some of whom are mean enough again to jew down this poor widow to the last farthing, that he may clear his \$7 out of \$8 *per diem*.

But something yet remains—

Eggs.—Without Poultry how are we to have eggs—and without eggs, how are we to have Poultry! The two things go together, and will, we may hope, remain mutually dependent on each other, notwithstanding the power of a thing called an *Eccaleobian*, by which *incubation* is performed without the aid of the hen.—There is in fact, no knowing what steam will not do sooner or later; so far, however, it has left every hen to lay her own eggs. The number of eggs imported into England in 1839, was 83,745,723, and the amount of the revenue derived from them to the Government, was \$150,000.*

The specific gravity of new laid eggs, at the first, rather exceeds that of water, varying from 1080 to 1090; but they soon become lighter, and swim on water, in consequence of evaporation through the pores of the shell.

"When an egg is boiled in water, and suffered to cool in the air, it loses about 32 hundredths of a grain of saline matter, together with a trace of animal matter and free alkali. The mean weight of a hen's egg is about 875 grains, of which the shell and its inner membrane weigh 93.7 grains, the *albumen* or white 529.8 grs., and the yolk 251.8 grs. The shell contains about 2 *per cent.* of animal matter and 1 *per cent.* of the phosphates of lime and magnesia, the remainder being carbonate of lime with a trace of carbonate of magnesia. When the yolk of a hard boiled egg is digested in repeated portions of strong alcohol, there remains a white residue having the leading characters of albumen, but containing phosphorus in some peculiar state of combination; the alcoholic solution is yellow, and deposits a crystalline fatty matter, and when distilled leaves a yellow oil. The albumen of the egg contains sulphur. The use of the phosphorus is to yield phosphoric acid to form the bones of the chick; but the source of the lime with which it is combined is not apparent, for it has not been detected in the soft parts of the egg, and hitherto no vascular communication has been discovered between the chick and the shell." [Brande's Encyclopedia.

We shall conclude this discourse with the following directions, which we consider the best, for *cooking* eggs, in several of the most palatable forms in which they can be prepared for the table. Man may say, in the pride of his wisdom, that any fool can poach an egg, or cook an omelette. Very well then; *let him try it!*

MISCELLANEOUS PREPARATIONS.

To Boil Eggs.—The boiling of eggs is a very simple operation, but is frequently ill performed. The following is the best mode:—Put the egg into a pan of hot water, just off the boil. When you put in the egg, lift the pan from the fire and hold it in your hand for an instant or two. This will allow the air to escape from the shell, and so the egg will not be cracked in boiling. Set the pan on the fire again, and boil for three minutes or more, if the egg be quite fresh, or two minutes and a half, if the egg has been kept any time.

To Poach Eggs.—Take a shallow saucepan or frying-pan, and fill it about half full of water. Let the water be perfectly clean, not a particle of dust or dirt upon it. Put some salt into the water. Break each egg into a separate tea-cup, and slip it gently from the cup into the water.—There is a knack in doing this, without causing the egg to spread or become ragged. A good way consists in allowing a little water to enter the cup and get below the egg, which sets the egg to a certain extent, before it is allowed to lie freely in the water. If the water be about boiling point, one minute is sufficient to dress the egg; but the eye is the best guide: the yolk must retain its liquid state, lying in the centre of the white. Have buttered toasted bread prepared on a dish, and cut in pieces rather larger than the egg; then take up the eggs carefully with a small slice, pare off any ragged parts from the edges, and lay them on the bread.—They may be laid on slices of fried bacon, when preferred.

Buttered Eggs.—Put a piece of butter in a saucepan, and melt it, adding a little milk.—Break the eggs into a basin, and pour them into the saucepan. Season with salt and pepper, and continue stirring the eggs till they are sufficiently dressed. Serve on pieces of toasted bread.

Omelettes.—Omelettes are composed of eggs and any thing that the fancy may direct to flavor and enrich them. For a common omelette,

* For the wonderful estimated value of the Poultry raised in the United States and in each State, see last number of the Monthly Journal, page 275—aggregate \$9,344,410. New-York, \$1,153,413; Michigan, \$82,730; Tennessee, the *crack corn* State, upwards of \$600,000, &c. &c.

take six eggs, and beat them well with a fork in a basin; add a little salt. Next, take a little finely chopped parsley, finely chopped eschalot or onion, and two ounces of butter cut into small pieces, and mix all this with the egg.—Set a frying-pan on the fire with a piece of butter in it; as soon as the butter is melted, pour in the omelette, and continue to stir it till it assume the appearance of a firm cake. When dressed on one side, turn it carefully, and dress it on the other. It will be dressed sufficiently when it is lightly browned. Serve it on a dish. The flavor may be varied, by leaving out the parsely and onion, and putting in finely chopped tongue or ham, oysters, shrimps, grated cheese, or other ingredients.

Pancakes.—Pancakes are made of eggs, flour, and milk, in the proportion of a table-spoonfull of flour to each egg. To make two small pancakes, take two eggs, and beat them well, and add to them a little milk. Then take two table-spoonfuls of flour, and work it into a batter with the egg and milk; add a little salt. Set a clean frying-pan on the fire, and put a piece of butter or lard into it. When the butter is quite hot, pour in the batter. Shake it frequently, to prevent it from sticking. When the under side is of a light brown, turn it. Serve the pancakes folded, with sugar strewed between the folds.—This is the way of dressing the common pancake: when required to be lighter, use more egg and less flour: and grated nutmeg may be added.

Fritters.—Make a batter of eggs, flour, and milk, as for pancakes, but with a little more flour. Apple fritters are made by cutting large pared apples in slices, dipping the slices in the batter, and frying them separately. They are done when slightly browned on both sides.—Another, and perhaps more common way, is to cut the apples in small pieces, and mix them with the batter, frying them, a spoonful in each fritter. Fritters may be made with currants in the same manner. Serve all fritters with sugar sprinkled over them.

[Chambers' Information for the People.

Should any gentleman object to the appropriation of a small portion of the 100 pages a month, which this journal contains, to the use and emusement of *Housewives*, he will please do so under his name, and state whether he is a married man. But why should even the *bachelor*, pushed from one place to another, and thrown about as if he were but the one-half of a pair of scissors, useless to all ends, except to drive out the dogs, keep the doors shut in winter, and pull the bell all the year round; why should *he* object to an occasional discourse for the benefit of the fairer and kinder part of creation. Let him fall sick and be thrown off his feed, and see who is his *best doctor!* Who will send and have his sheets aired and his bed warmed, and provide him a clean night-cap, and his saucepan of panada or chicken-water, and nurse him as if he were of consequence in the world; is it not the *Housewife?*

Be it known then, until some gentleman enters his caveat, under his proper name, we shall appropriate a portion of the Monthly Journal occasionally to *Housewifery*, and shall treat of a few things that may be mentioned in advance, as they occur, as for example—Precautions as to fire; clothes catching fire: burns, scalds, cuts; poison; everything about a house and its furniture, such as earthen ware and china, tables and chairs; baths and foot warmers; servants and cleaning; oil-cloths; walls of rooms, paper-hangings; kitchen vessels, dish covers; knives, lamps, lamp glasses; furniture; varnishing; bottles; flannel and woolen articles; silks; clear starching; smoky chimneys: salting and smoking meat; preserving flowers fresh; destroying vermin, rats, mice, bugs, fleas, lice, flies, moths, slugs, and a hundred other things, too tedious to mention. Then we will take up the toilet, and treat of preserving the teeth, the nails; will tell them how to make pomatum, cold cream, spermaceti ointment, and cosmetics of all sorts. In due time they shall have the best recipes for every thing that belongs to the dairy, the garden and the flower bed. Not such as are to be found in "5,000 recipes," made, like Pindar razors, *for sale*, but *founded on experience, and recommended for their common use, economy, and practical excellence.* What, dear, good, lady Housewives, will we not essay for your benefit!

THE GOOD HUSWIFELY PHYSIC.*

BY THOMAS TUSSER, GENT.

Good huswives provide, ere an' sickness do come,
Of sundry good things in her house to have some:
Good *aqua composita*, and vinegar tart,
Rose-water, and treacle, to comfort the *(c)* heart.
Cold herbs in her garden, for agues that burn,
That over strong heat to good temper may turn;
White endive and succory, with spinage enough—
All such, with good pot herbs, should follow the [plough.
Get water of fumitory, liver to cool.
And others the like, or else go *(b c)* like a fool;
Conserves of barberry, quinces, and such,
With sirops, that easeth the sickly so much.

Ask *Medicus* counsel, ere med'cine ye make,
And honour that man for necessity's sake.
Though thousands hate physic, because of the cost,
Yet thousands it helpeth, that else should be lost.
Good broth and good keeping do much, now and than,
Good diet with wisdom, best comforteth man.
In health, to be stirring shall profit thee best;
In sickness, hate trouble, seek quiet and rest.
Remember thy soul; let no fancy prevail;
Make ready to God-ward; let faith never quail.
The sooner thyself thou submittest to God,
The sooner He ceaseth to scourge with his rod.

Variations.—*(c)* thine. *(b c)* lie.

* Though powerful medicines should never be administered, except by professional men, certain simple remedies ought to be kept in every family; not, indeed, such as are here enumerated, but such as improved medical knowledge has shown to be equally safe and efficacious. The list, however, is curious as an evidence of the state of domestic medicine in the sixteenth century; and the advice which follows proves the good sense and piety of the writer, which, indeed, are universally conspicuous in his works.

[Doctor Rush's opinion being once asked, what per cent. had been added to human life by the art of medical practitioners, answered, that it depended upon whether old women were to be included in the list—because if not, the addition would be much less.] [*Ed. Farm. Lib.*

THOUGHTS ON THE DISTRIBUTION OF LABOR;

SUGGESTIONS FOR THE FORMATION OF INDUSTRIAL SOCIETIES FOR SPECIAL OBJECTS.

WHAT has most contributed to the progress of improvement in manufactures, is the *distribution of labor* which they admit of. The mind of the operative being confined to a single point, he attains greater proficiency, and can accomplish much more than if he were taken frequently from one part of the manufacture to work at another. In this case, he gets his "hand out," as it is termed; and hence a smith who might make a horse shoe at a heat, as we have known a man to do, might yet not make half as many nails in a day as a boy whose business had been nothing but nail-making all his life. A man who only makes nails occasionally, will make but 800 or 1,000 a day; while a boy who has never worked at any thing else, will make 2,300. Even in pin making, labor is so distributed, that the man who makes the pin, never fashions the head or sharpens the point.

Agriculture would doubtless have attained much higher perfection in all its processes, if it would admit of the same distribution of labor that may be resorted to in other manufactures; and house and ship building. The process of sowing, plowing, hoeing, reaping, would all be more perfectly executed, if those who perform them, could find constant employment at, and be exclusively confined to each one of these operations. But the farm laborer, and especially the Yankee farmer, has to exercise his ingenuity on every thing that is going on, in its turn, and so becomes Jack-of-all-trades, without being as perfect at any, as if he were to attempt but one. In Europe, the case is somewhat different. In France, for instance, *mole catching is a trade;* transmitted from father to son, and men have made independent estates by extraordinary expertness in the practice of it. In Spain, a *shepherd* is nothing but a shepherd; the calling "runs in the family;" and thus a shepherd's son, by the time he is 18 years old, learns more of the diseases, habits, breeds, and management of sheep, than a common laboring hand would in 40 years, who attends a little to sheep, and a little to every thing else. A practiced shepherd would shear more sheep in a day, than a raw hand who might possess more intelligence and physical activity, could shear in three, and in the operation, draw less blood from the flock, than he would from a single sheep.

Seeing how it is that "practice makes perfect," this principle of the distribution of labor, we find is acted upon practically, where it can be done; and if it could be carried through in every operation into which agricultural industry divides itself, as we before said, greater improvements would have been realized. As it is, on every large plantation for example, you will find that Abraham may be the blacksmith and the butcher, Jacob the miller, his son Hanover the distiller and flax breaker, Tom Peel the head carter, and Cyrus the foreman in the field; go to an old family estate like Brandon on the James river, and you will find an old man, gardener, *practically* skilled in the physiology of vegetables and flowers, while another venerable and grey bearded ichthyologist, most knowing in all the signs of the tides and the weather, has charge of the boats and the lines, and the nets, and will be sure to have, in time for dinner, a good mess of fish, or crabs, or oysters, when any raw pretender would have the worst of "fisherman's luck;" and every one knows what that is.

If it were possible, for instance, that the labor involved in making tobacco, could be so distributed, that raising and selling the plants, cultivating and selling the green crop, curing it, culling and tieing up, and finally seasoning and preparing it for the manufacturer or the shipper, could have a separate set of operatives, exclusively assigned to each link in the chain, and these operatives each find constant employment on his particular branch, the whole business of tobacco husbandry might no doubt be carried on with much greater perfection and success, and the annual value of the crop, and the interest on the capital and labor embarked in it would be proportionably enhanced

In mechanics, the making of a knife is apportioned out among several persons; the making of the blade, the handle and the rivets, become, as it were, so many separate trades, and thus the same number of men will make a much greater number, and of course their labor, which is *their* capital, becomes so much the more productive; and it is this distribution and greater productiveness of labor, very much enhanced by more perfect tools, that make the great difference in the condition of the savage and the civilized man. Compare the rude implements of the savage, with the saw, the auger, and the hammer, and you at once see the cause of the difference between his bark hut and the monarch's

palace—between his bark canoe and the magnificent steamboat—between his war club and Colt's revolving pistol. The story of the tools named, their invention and uses, would be the history of civilization itself. It would trace the progress of the arts, from the use of the gourd to the manufacture of the celebrated "Portland's mystic urn." In every trade, as you distribute duties, you fix responsibility and promote skill. But having indulged in these reflections, let us apply them where they can be applied, and it is at this we have been aiming. Let the principle be kept in mind in the *formation of societies for agricultural improvement!*

Our Agricultural Societies are too anomalous, too heterogenous. They undertake too many things at once—the result is that much is attempted, but little is done well. Look at the vast variety of objects comprehended in the bills of those *annual* exhibitions—not an animal, nor a machine, nor a fowl, nor a grain, nor grass, nor vegetable, nor fruit, that a single Society, coming together once a year, for two days, does not undertake to improve. The result is, that while some are improved a little, others are not at all, and the aggregate melioration from year to year, is *scarcely perceptible.* Would it not be better to form out of the same members, different societies for *special objects?* For example, the Improvement of Horses, or of Agricultural Machinery. These are important branches of rural economy, and each a study in itself—and the first inquiry should, in all cases, be, not what premiums should be given for particular objects, but whether the *object deserves encouragement at all.* Premiums have been offered in Maryland, for more than twenty years, for heaviest crops of beets and turnips and carrots and potatoes. Well, let us ask, not whether the quantity per acre, has been going on increasing from year to year, as the result of greater skill elicited by these premiums, *but* has the aggregate culture itself *extended a single acre in that time;* and if not, is it not a broad hint that you should pause to inquire whether there be not some strong reasons, in the circumstances of the country or locality, some defect in soil, some uncongeniality of climate, some *un*economical result of labor; in a word, some powerful considerations in the nature of the case, that forbid the extension of root culture. Indications which admonish you that you are working against the natural policy and interests of those you represent. That your bark, pushed against wind and tide, is makinge lee way! would it not be better to direct your zeal—so well meant, so patriotic, so admirable in itself—to some *new objects?* For one, among others that might be named, would it not be advisable to offer a high premium for the earliest and most successful experiments which shall illustrate the expediency —or not—of adding *Madder to the crops now cultivated.* Those who use it in dyeing, think the farmer might raise it with a good profit, at one-third of its present price. We shall in due time, tell all we can learn about its nature, cultivation, uses, &c. We only mention that one thing, because it comes uppermost, as the pen glides along. Another object may be suggested as well worthy of diligent inquiry, by a special society, who should give it earnest and exclusive attention. That is, an inquiry into the practicability of applying *steam power* to a variety of *agricultural purposes,* to which it has not yet been extended in this country? If the simpler and less efficient contrivances for giving greater productiveness to man power, have been the cause of multiplying the human race, and of augmenting their comforts and enjoyments; if, in fact, these may be considered as proportioned to the number and perfection of artificial labor-saving inventions, why not apply the productive powers of steam to Agriculture, as well as to mechanics, manufactures, navigation and war? Who that reflects on the advantage which steam power affords in its greater rapidity and certainty, does not see what an advantage might have been taken of its use in the late rise in the price of grain, by getting it ready for market in less than half the usual time. It is estimated in England, that a six horse steam power will thresh and clean nearly four hundred of our bushels a day. For fuel, "culm or dross" is generally used, and unlike horse power, when not working, it *costs nothing.* Is there any good reason, we repeat, why steam power should not be made to do for Agriculture, what it has done for manufactures and the arts? Is not the enjoyment of this great, this invaluable productive power, applied with such effect, in the industrial operations of other classes, the reason why they so much outstrip the tillers of the soil, and with less capital, go ahead of them in population and wealth. In our next, we shall give a more extended view of this subject —suffice it now to prompt the farther consideration and inquiries of American Agriculturists to quote a writer, who says, "so rapid has been the extension of steam power *to farms* in this vicinity, that from the fine elevations round Edinburgh, more than 100 steam engine stalks or chimneys, may be observed as land-marks of the farms, and giving a peculiar feature to the landscape."

We have been told that Mr. Bolling, to his honor, has had the enterprise to put up a steam machine on his farm in Virginia, and finds it exceedingly satisfactory, convenient and profitable; and we doubt not his example will be followed—but then *how slowly,* compared with what it would be, were the subject investigated and illustrated, as it might be by an *active, spir-*

ited, intelligent association of patriotic individuals!—with the pages of the Farmers' Library at command, ready to have all their drawings and diagrams gratuitously engraved and distributed? These are among the glorious results we anticipate when landholders take upon themselves the duties of legislation and control of public money levied on themselves directly, or indirectly which is worse, and lavished on objects alien to their pursuits and at war with their best interests.

But our chief object at this time was to show, what have been the fruits in a single case, of the establishment of a society for a *single object in another country*. Why not establish a similar society in *our* Hemp and Flax region?—But to the case in view—we commend what is here set forth especially to the cultivators of Hemp and Flax in *Virginia, Ohio, Missouri, Kentucky, Indiana, North Carolina*, and others engaged in this branch of industry, the States mentioned being the largest producers, if *any* confidence is to be placed in the Census. The best reference we can make for quantities produced by each is to the Tables in our last, from "*Tucker's Progress of the United States.*"

In towns, for promoting improvement in the arts, there is the less necessity for such separate and especial associations, for there the whole community may be considered a club within itself. They are in constant daily communication of thought, and in the way of observing every new discovery. They work, as it were, under the eyes of each other, and the constant interchange of information produces an aggregate of knowledge, and all imaginable acceleration in the career of improvement and efficiency. The very condition and circumstances of existence of those who make up dense communities, supply the necessity and the place of organized associations, so useful to isolated farmers, if they would keep within sight or hearing of those who are marching on other lines of industrial pursuits.

In Ireland, then, there exists, as it appears, and has done for some years, a "SOCIETY FOR THE PROMOTION AND IMPROVEMENT OF THE GROWTH OF FLAX." Among other proceedings, to throw light on the culture and management of flax, this society published a small tract, comprising the best information to be had at home and abroad on that particular subject. It is well known that the value of the crop depends mainly on the care taken in the *preparation of the fibre*, the value which that may be made to assume when it has undergone the finishing process of the finest manufacture, and the amount of employment which the produce of only three acres may afford are well illustrated by the following exposition by Doctor KANE.

A Mr. William Blakely, he says, grew last year near Warringstown, Ireland, three statute acres (1 a. 3 r. 16 p. Irish measure) of Flax, which he managed strictly according to the directions put *forth by the Society*. The produce of the field was purchased for 15 shillings, say $3,75 per stone of 16 pounds, by the eminent manufacturers of cambric, Messrs. McMurray and Henderson, who pronounced it equal, if not superior, to any Flax they had ever seen, and that they had given for foreign Flax of inferior quality thirty six shillings per stone.

The entire produce of the three acres was estimated at 120 stones, which at 15 shillings, would give the farmer £90 or $450; but as a part of the Flax had not been gathered, and might possibly fall below the estimate, Doctor Kane puts down the crop, with *certainty* at 100 stones, which will realize £75, or $375.

This Flax, when Doctor Kane wrote, was in process of conversion into *cambric pocket* HANDKERCHIEFS, and was capable of being spun into thirty hanks to the pound, and was to be spun by hand. Mark now, says he, the employment this will give.

"It will give constant employment for twelve months to 158 women to spin it; 18 weavers will be occupied a like time in weaving, and it will employ forty women for a year to hemstitch (or vein) the handkerchiefs, thus giving constant employment, for twelve months, to 210 persons.

"It is curious to trace the result of the process which this flax is now undergoing. It will produce 210 webs of cambric, each web containing five dozen handkerchiefs, each dozen will be worth 50 shillings, and the entire produce of the three acres of flax when carried through the entire process of manufacture will be worth £2,600 or $13,000, or upwards of $4000 per acre for the manufactured produce. What an illustration is here, of the dependence of the world upon *Agriculture!*—and yet how little of the world's legislation is really directed *by and for the landed interest!* The calculation is, as will be seen in a subsequent chapter, that the labor necessary for these three acres, would be seven days for three men, fifty-four days for three women, and four and a quarter days for a horse.

It has been seen to how many people, proportionably, the product of the labor of a few tillers of the soil gives employment and support; who, in their turn, make demands on the surplus products of the agriculturist, demonstrating the harmonious dependence of these classes on each other, a harmony and mutuality of support that should be left in their natural relations, and that ignorance or wickedness only would seek to disturb or impair.

The quantity of flax grown in Ireland appears to be on the increase, and its quality to be improving, as, in the Report of the "*Flax So-*

ciety," it is stated that the amount of the crop in 1841 was 25,000 tons, averaging £45 or $225 per ton, whilst in 1843 it was 36,465 tons, and the average value from improved quality considered to be £55 or $275! This increase of value $573,250 being, if not wholly, certainly in great part *attributable to the exertions of that very useful society!!*

Why not form such societies in the hemp and flax districts of the United States? We have no conception until it is systematically undertaken, how much light may be concentrated on every industrial pursuit. We respectfully offer our "FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE" as a medium for collecting and a repository for storing away all such information for the common benefit, and we earnestly suggest that Editors of Western and South-Western papers, including those of Virginia and North Carolina, should disseminate the articles here given on the subject of flax and hemp, branches of industry susceptible of being much and profitably extended in our country.

JERUSALEM ARTICHOKE....(*Helianthus tuberosus.*)

LET any important discovery be made that may be beneficial to the manufacturer, the mechanic, or the mariner, its application is immediate, and it at once comes into general use; not so with the farmer. Let the new product be ever so valuable, the new process ever so cheap, he is slow to adopt the one, or to practice the other. Witness that most precious gift of the new world to the old, the Potato (*Solanum tuberosum.*) It required an hundred years from its introduction by Sir Walter Raleigh, to bring it into general use; and thus it is with the clover, thus with lucerne, thus with plaster, thus with lime, and thus with many of our most valuable agricultural implements. But let us hope that the day of regeneration for the farmer is at hand; that he will shake off the lethargy that has so long held him enthralled, and take at once the foremost place in the great race of human improvement

These reflections are suggested to the writer by the almost universal neglect of that most valuable tuber the Jerusalem artichoke, (*Helianthus tuberosus*) a plant that (should the rot in the potato not be checked) is destined to take the first rank among roots subjected to field culture. Although a native of the warmer parts of this continent, it is one of the hardiest of all cultivated plants, deriving, as it does, through its large leaves, most of its sustenance from the air, it is a great improver, it is wonderfully productive, and thrives in the poorest soils. Eagerly sought by horses, cattle, sheep and swine; it furnishes an aliment as nutritious and healthy as it is cheap. Yvard, the distinguished professor of rural economy at Alfort, whose contributions to agricultural science are so valuable, recommended its cultivation both by precept and example. Arthur Young affirms the net profit of its cultivation to be much greater, beyond all doubt, than that of any other ordinary agricultural production; and finally it remains in full production on the same spot for ten years or more. The writer will here state what he knows of its cultivation, having witnessed it on a large scale in France on the estate of George Lafayette, brother-in-law to the Count de Tracy.

As opportunity offers through the winter, the ground is flushed up as deeply as possible with the ordinary two horse plow; in the spring, cross plowed and as thoroughly pulverized as possible; the land is then laid off with the double mould-board plow in furrows two feet apart, women and children follow the plow, dropping the *whole* tubers from eight inches to one foot apart as nearly as may be, another plow follows to cover them up; when the plants are well up the harrow is run over the field lengthway the furrows, and finally, one working with the shovel-plow or cultivator, when the plants are eighteen inches high, and the crop is made.

The roots are suffered to remain in the ground to be thrown out with the plow as wanted through the winter, or hogs are turned in upon them.

By an accurate chemical analysis, the artichoke is found to contain *one-third* more nutriment than the beet; it is as much relished by horses as the carrot, is more nutritious and of course much less expensive; it yields a fair profit on soils too poor for the potato, the beet or the carrot; few plants suffer as little from drouth; it withstands the most intense cold, it is never attacked by insects or disease, and may remain in the ground with perfect safety until used. Waste land stocked with the artichoke and apple trees would make the finest range imaginable for swine. F. G. S.

CELLARS, *versus* SPRING HOUSES FOR DAIRIES.

THE following is taken from the OHIO CULTIVATOR, which we may presume forms a part of the reading of every farmer, at least in that populous State, a State of which it is needless to say any thing, except to note the naked fact, that from a population in 1790 of 45,365 (half the number of the State of Delaware,) she has gone up in fifty years, (1840) to 1,519,467, solid, substantial, working men and women, boys and girls.

If it would not savor of presumption to speak more particularly of a work so much better known than this is, we would add, as to the CULTIVATOR, that it is edited with much zeal and ability —its whereabouts is Columbus, and the price $1—published 1st and 15th of every month.

The number for 15th Nov. thus corroborates, on editorial experience, what has been asserted in other papers, and is well worthy of attention on such authority; by-the-bye, our brother Editor of the Cultivator ought to be a happy man, considering that he is—a *Bachelor!* We see him on all occasions associated with young ladies in charge of the *Floral Departments* at the Agricultural Exhibitions—a department which is sure to attract and be surrounded by the *fairest* of the *Fair*—and now, we have his own confession, that he has been "prying into the mysteries of quite a number of good dairy maid's milk-houses!" If such are *Bachelor's privileges*, we shall cease to wonder that Benedict is *not* a married man!

We are inclined to believe, however, that the kind of house he proposes to make will not fully answer his expectations. In our rambles among the farmers for a number of years past, we have pryed into the mysteries of quite a number of good dairy women's milk houses, and the result has been a conviction that the introduction of running or standing *water* into the milk house *is more injury than benefit*. We are aware that this is contrary to the opinions of the majority of housewives. They think a good *spring house* is almost indispensable for producing good butter in summer; and yet we have never found on the tables of those who possess this much envied advantage, as good butter as where a well constructed cellar is used for the milk room. The reason is, the *dampness* occasioned by the water, is more injurious to the milk and butter than is compensated by the coolness it occasions. It is found that a *dry*, as well as *cool*, atmosphere is needed for this purpose; and it is better to dispense with some of the coolness than *all* of the dryness.

Our advice to 'A SUBSCRIBER' would therefore be, abandon entirely the idea of bringing water from a well, a cistern or an ice house, and construct a good dry cellar on your northern exposure, with thick walls of brick or stone, to preserve an even temperature; a *stone* or cement floor, well drained below; and windows on each side to afford ventilation. Plaster the ceiling, and avoid as much as possible the use of wood in all the structure. It is needless to add that nothing but milk and butter, and the vessels or implements used therewith, should be admitted into the milk room. Any article or substance that is liable to contract mould, or cause the least smell, will affect more or less injuriously the flavor of the milk and butter. Hence, too, the indispensable necessity of *perfect* CLEANLINESS—the great CARDINAL VIRTUE of all good dairy management. (The water that flows from an ice house in summer, has always a musty smell, that would ruin the milk and butter in a dairy.)

We shall have more to say on this subject at some other time, and shall be happy to have our correspondents express their opinions, or give us the results of their experience in relation to it. In addition to what has been said, the following excellent article, from the (Philadelphia) Farmers' Cabinet, will suffice for the present:

"THE MILK CELLAR.—It is a curious fact, but by no means unaccountable, that in many parts of the country the milk *cellar* is superceding the *spring house*,—an appendage that has always been considered indispensible for the production of good butter, be the other qualifications of a farm and its appurtenances what they might. While on a visit to Wilmington, Delaware, I had occasion to remark the excellence of the butter at my friend's table, when he replied, he always selected the best cellar butter at market, for the use of his family, giving it as his firm conviction, that butter made in a cellar, was far preferable to that made in a spring house, its great recommendation being, in keeping sweet and good much longer, and retaining its fine flavor and color to the last, which spring house butter would not do. And he observed, it is customary to account for the greater price which some dairymen obtain for their butter in the market, by saying it is *cellar butter*.

Of course, it is readily admitted that much depends on the mode that is adopted in the management of the dairy, commencing with the breed and feed of the cows, and ending with the manipulations of the butter; but the idea is gaining ground, that the best butter is to be made in a cellar, all other circumstances being equal

On reconnoitering amongst my friends, I found that several of them had substituted the cellar for the spring house; and I do not know one who is not satisfied with the arrangement, except it be where the cellar is dug in a damp soil, or has been most injudiciously opened to the well, the evaporation from which fills the room with constant moisture, which may be found adhering to the walls, the ceiling and the wood-work, the shelves, and particularly the inside of the door, causing a damp and clammy feel, and a nauseous, mouldy smell, which the butter imbibes, to its lasting injury; indeed no good butter can be made in such places.

But another revolution is taking place even

amongst the advocates for the cellar; it is no longer thought necessary to dig the cellar very deep, or to arch it over with stone or brick, with an air passage through it for ventilation—a *vault* as it is more properly then termed: it is found sufficient, if the cellar be sunk a few feet below the surface of the earth, with a wide and shallow window on each side, the bottom of it level with the ground outside; well protected with a wire guard to keep out vermin, large flies, &c, and provided with a close glazed sash, which can be opened and closed at pleasure, by lifting it up to the *ceiling*, which ought to be no higher than the top of the windows; so that the air of the cellar can be ventilated by opening the windows of the two opposite sides, according to the way the wind sets at the time, shutting them quickly when necessary; for in cold, windy, or damp weather, the sooner the windows are again closed, the better. Indeed, to the management of the cellar in this particular, much of the success of dairying is to be attributed; cold and damp air being unfriendly to the secretion of cream, and its proper and entire separation from the milk. Hence, therefore, it is a bad practice to set the pans on the brick floor of the cellar; they ought always to be placed around on shelves, about three feet in hight, and these, after being well washed with hot water, should be wiped quite dry, that no mouldy evaporation might take place to spoil the butter. The air near the floor of a dairy is always impure, being loaded with acid vapors and putrid exhalations, the density of which confines it to the lowest part of the room; hence it is, that the doors of some dairies are made with lattice werk, that the air near the floor, as well as that near the ceiling, might be ventilated at the same time: these lattices being furnished with sliding panels, to be kept closed in bad weather. The milk cellar ought always to have a northern aspect, and be well shaded by trees, not growing too near the windows, so as to impede a dry current of air, or to create a moist atmosphere: this consideration being of more importance than would readily be imagined.

"Cellars thus constructed and carefully attended, will, no doubt, supersede the use of spring houses generally, before many years have passed away; by which the business of the dairy will be rendered more agreeable, less laborious, and far less inimical to the health of those, particularly of females, whose occupation it is to attend to its never ceasing duties."

NOTE.—*On the composition of floors for Meat Houses, Dairies Quarters, Poultry Houses, &c., to guard against rats, and to promote dryness and cleanliness.*

Of what use it, that the good housewife takes pains to secure a good stock of poultry, and a good supply of the best butter, and bacon of the finest quality, if the husband does not take care that proper houses are constructed for their preparation and preservation? Every own knows how liable they are to be infested with rats, if pains be not taken to guard against them, especially in *making the floors rat proof.*

To speak now of the *meat or smoke house,* more particularly, it should stand on a foundation of brick or stone, going down *below the influence of frost.* Rats, it is well known, will go down on the outside of the wall, and burrow under it and come up inside. It is said that if in building the foundation wall, you project it *half brick* in a continuous line all round, at *some distance below the ground* on the outside, you will arrest the subterranean operations of the enemy. 'Tis said that the rat always burrows *close* to the wall, and that when he reaches the projecting line of brick, obstructing his perpendicular descent, he does not attempt, or cannot burrow *round it*, but gives up his felonious design as a bad job. We believe in the truth of this suggestion, but whether or not, his ravages may be prevented, and other great inconveniences avoided, by making the floor to out houses, in the manner described below. We obtained the directions from Col. TOTTEN, whilst, as will be seen by the date, we were in the Post Office Department at Washington; but always giving our leisure time to such service as we could render, without fee or reward, to the cause, to which we are now devoting all our time, not only for our own bread, but to teach how bread may be best increased for the commonwealth.

Of Col. Totten, it would seem vain for us to speak as a West Point graduate, and one of the most scientific officers of the army; whose attainments do credit to that branch of the public service.

Among the books, by-the-bye, which ought to constitute every Farmers' Library, is "TOTTEN ON MORTARS," being "*Essays on Hydraulic and common Mortars and on Lime burning.*"

Engineer Department,
WASHINGTON, Nov. 11th, 1844.

MR. J. S. SKINNER, Washington, D. C.

SIR: In compliance with your request, I send you a description of a concrete that will answer a good purpose for floors, &c.

The mortar is to be made of one part of sand to one-half part of hydraulic cement, measured in rather stiff paste. Then one part mortar, thoroughly mixed, is to be united with two and a half parts broken stone or bricks, the largest pieces not exceeding 4 oz. in weight, or of gravel of similar sizes, or of oyster shells, or of either or all of these mixed together. These coarse materials must be free from sand or dirt. The concrete thus made, must be put down in a layer of not more than 6 inches, which will be about the proper thickness for the floor; rammed very hard, and until all the coarse particles are driven out of sight; care being taken to bring the top of the mass into the true place of the floor by the first process; no subsequent addition of plaster being admissible. By the help of a straight edge drawn over guide pieces, the top surface may be made smooth and even by the first operation.

The concrete should contain no more water than is necessary to give the requisite plasticity to the mass. The floor should be covered as soon as finished, with straw or hay, which should be kept wet for several days, the longer the better.

A little lime in paste, may be substituted for an equivalent part of the cement paste, but the less lime mixed with the cement paste, the better.

FLAX AND HEMP HUSBANDRY.

We have elsewhere, and more than once, intimated our sense of the importance of that branch of American Industry which has for its object the production of the *Fibre Crops*. Of Cotton we have already treated pretty fully, and shall return to it whenever any thing may offer seeming to be calculated to improve the cultivation, or to advance in any way the interests involved in its production. We should rejoice to have the interests referred to in the heading of this paper, fall into hands as well able to illustrate them, as were the natural history, growth, and value of the Cotton crop, by Mr. Seabrook.

Opening wide our pages to the elucidation of this and every other industrial pursuit of the country, we proceed now to give some views of the results of Flax and Hemp culture in Ireland, which appear to be well calculated to engage the attention of all Americans interested in their growth in this country.

If Mr. Billings has supplied the desideratum so much wanted in the *work of preparation* for the manufacturer, which he supposes he has, and to which we referred in our last, a most important advance will have been made in the progress of improvement and great acceleration and breadth will have been added to it as a source of national industry and wealth. We invite consideration to the subject. The reasoning of Doctor Kane to show that it need not be attended with exhaustion of the land is new and highly important.

In relation to the actual agricultural and manufacturing industry of Ireland, it is still more important to describe the circumstances of those crops which have for their ultimate and valuable product the vegetable fibre. Of these fibre crops, those of most interest are flax and hemp, especially the former, on which so large a proportion of the population of the north of Ireland may be considered to depend for subsistence.

The Flax plant, to which I shall first direct attention, may be cultivated on any soil of moderate fertility, but, of course, will grow in great luxuriance, and yield its largest produce, where the land is most fertile.* It is, however, indispensable that the soil be rendered thoroughly open and perfectly clean. The order of rotation with other crops varies in different countries, but on the Continent, as in Belgium, where its cultivation is best understood, the ordinary custom is, to bring it in after a corn crop, and not to introduce it into the course more frequently than once in seven years. The flax is a very exhausting crop, and hence requires abundance of manure, which is supplied to it in Belgium, in the most effective form, as liquid manure. It will be shown, immediately, that the flax contains but little lime, the presence of which, in a caustic form, in the soil, appears to be injurious to the plant, hence it is proper, where lime has been necessary to the soil, to intermit the culture of flax for a certain season [until decomposed].

The composition of the soil on which the cultivation of Flax may best be carried on, being a problem of the highest practical interest to this country, the Flax Improvement Society of Ireland, in pursuance of their laudable objects in promoting this branch of industry, commissioned me to make analyses of some soils which had produced remarkably good crops of Flax. The soils were all light clay loams, and afforded the following results, which I extract from the Report of the Society:

	No. 1.	No. 2.	No. 3.
Silica and silicious sand......	73·72	69·41	64·93
Oxide of iron	5·51	5·29	5·64
Alumina	6·65	5·70	8·97
Phosphate of iron	·06	·25	·31
Carbonate of lime..............	1·09	·53	1·67
Magnesia and alkalies, with traces of sulphuric and muriatic acids	·32	·25	·54
Organic matters	4·86	6·67	9·41
Water...........................	7·57	11·48	8·73
Total...........................	99·78	99·58	100·11

The organic matter in these soils was rich in nitrogen; their fertility is, therefore, from the analyses, easily understood.

A point which may be noticed in relation to the growth of Flax is, its quality is essentially improved [finer fibre] by thick sowing. This arises, not from there being more Flax grown, but from the closeness of the plants forcing them to grow upwards with a single stem to gain access to the air, and thus to prevent their branching, by which the fibre is shortened and rendered irregular. Every thing in the cultivation of this plant is subservient to the formation of a long and delicate woody fibre, and it is owing to this fact in the practical history of the Flax, that certain sources of economy in its Agriculture, which I shall point out become practicable.

The ligneous or woody fibre, which finally is converted into the linen thread, is composed of the same elements as starch and sugar, and in nearly the same proportions. Omitting certain minute differences between the true fibre and the matter which occupies its cells, its composition may be expressed by the formula $C_8H_{12}O_{12}$ and, when pure, it contains no inorganic matter. Its elements are, in 100 parts:

Carbon..........................	50·00
Hydrogen........................	5·55
Oxygen..........................	44·45

Hence this fibre, which constitutes the entire

* Coarse fibre on fertile soil, sown in equal quantities. It is indigenous on the Wolga and the Uralian Mountains. [*Ed. Farm. Lib.*

money value of the Flax crop, is produced during the life of the plant, by the elements of the atmosphere, and the materials taken from the manure and from the soil are, in reality, employed by the plant in organizing substances which do not make any return to the farmer, but which are, on the contrary, under certain circumstances, considered to be positively a disadvantage. It is, therefore, of importance, that it should be understood that by a proper system, the growth of Flax and similar fibre crops should be destitute of all exhausting influence. That the materials drawn from the soil by such a crop should be found in the waste products of its manufacture, and should be available by being returned to the soil, to restore it to its original condition of fertility. In order to render this principle fully intelligible, I shall enter into some detail regarding the processes to which the Flax is subjected, and the nature of the products obtained from it.

The Flax, when it has grown to suitable maturity, according as the design is to allow it to ripen its seed or not, is pulled, and either immediately, or in the next spare season, according to the circumstances of the locality, it is subjected to the process termed rotting or watering. In the stem of the Flax there may be recognized three structures, the outer skin or epidermis, covering a close network of fibres which encloses the plant as in a sheath, and in the centre a stem of dense pithy material. The fibrous network is connected together by a glutinous matter, which must be decomposed before the fibres can be separated from the stem, and it is to soften and rot this substance that the plant is steeped. If the steeping be continued too long, the fibre itself may rot, and be weakened and injured in quality; if the steeping be not continued long enough, the fibres are not thoroughly separated from each other, and the quality of the Flax is coarser than it might be.* The general tendency is not to rot the Flax enough, but it is a process requiring very careful management and attention, to conduct it with the greatest advantage.

In order to ascertain what occurs during the steeping of the flax I instituted chemical examinations of the substances and process. I have already given the composition of the pure ligneous fibre, and in the following tables are shown the results of my analyses of the composition of the Flax stem as it grows, and of the ashes which it yields. These are in fact its organic and its inorganic elements. The composition of the ash varies very sensibly with that of the soil upon which the plant is grown, but it is not necessary to introduce that consideration for the present object.

FLAX PLANT.

Carbon	38·72	Oxygen	48·39
Hydrogen	7·33	Ashes	5·00
Nitrogen	·56		
Total			100·00

ASHES OF FLAX PLANT.

Potash	9·78	Sulphuric acid	2·65
Soda [sea air]	9·82	Chlorine [sea air]	2·41
Lime	12·33	Carbonic acid [air, charcoal]	16·95
Magnesia	7·79	Phosphoric acid	10·84
Oxide of iron and alumina	6·08		
Silica	21·35	Total	100·00

Note.—Phosphate of lime and potashes must be valuable and important restoratives.

[*Ed. Farm Lib.*

* The fibre is broken and will shorten the Flax, making waste in the subsequent processes. I do not see that it can make it *coarser*. [*Ed. Farm. Lib.*

When the Flax is steeped, the water acquires a darker color, a disagreeable odor, and, it is well known, becomes poisonous to fish. This arises from the solution of the glutinous material which had cemented together the pure fibres. To examine this material, I employed it as it is produced when the steeping water is dried down, and the following tables show its organic composition, and the composition of the ashes which it yields. I term this substance, for brevity sake, Flax-steep extract.

	Flax-steep Extract.	*Flax-steep Extract without ashes.*
Carbon	30·69	52·93
Hydrogen	4·24	7·31
Nitrogen	2·24	3·86
Oxygen	20·82	35·90
Ashes	42·01	
Total	100·00	100·00

It is thus seen, that the steep-water dissolves out a great quantity of nitrogen, and of the inorganic materials of the stem; in fact that it removes from the plant almost every thing that the plant removes from the soil. This is confirmed by looking to the composition of its ashes, which are shown by the following analytical results. There are found 42 parts of ashes, in every 100 parts of flax-steep extract, consisting of

Chloride of potassium	3·8	Phosphate of lime	2·1
Sulphate of potash	4·4	Carbonate of lime	4·0
Carbonate of potash	3·8	Carbonate of magnesia	2·0
Carbonate of soda	13·2		
Silica	5·5		
Phosphate of iron and alumina	3·2	Total quantity, pr cent.	42

The steep-water thus dissolves, especially the alkaline ingredients, and the phosphates of the plant, and hence leaves the rotted stems in a condition of almost pure ligneous matter.

The stems of the plant, after having been thus steeped, undergo a rough bleaching and drying, by being *grassed* for some days. They are then broken by the hackle, and finally, the fibre separated from the residual woody pith or chaff, by the operation of scutching. These operations may be carried on either by hand or by machinery, and the relative value of the systems may hereafter require attention. The fibre, after these processes, is sent to market; it passes into the hands of the linen manufacturers, and becomes the element of mechanical industry, such as has been treated of in the earlier chapters of this work.

Now, the agriculturist should steadily bear in mind that the fibre which he sells to the flax spinner has taken nothing from the soil: all that the crop took out of the soil he has still in the steep-water, and in the chaff of the scutched Flax, and if, after suitable decomposition, these be returned to the land, the fertility of the latter will be restored, and thus materials, at present utterly neglected, and even a source of inconvenience, may be converted into most valuable manure. [Very important, and entirely forgotten by growers.]

That the water in which Flax has been steeped possesses powerful influence as a manure, has been observed by various persons; thus round the edges of bog holes used for steeping, a luxuriant and tender herbage often arises in vivid contrast to the surrounding barren peat. Various agricultural authorities have noticed its beneficial effects when experimentally used, but I shall only quote, in order to show the at-

tention it deserves, the following notice by Mr. Wakefield: "The water in which Flax has been immersed is, in Ireland, entirely neglected, but Mr. Billingsby mentions it as an excellent manure, and no country in the world, perhaps, affords better opportunities of employing it than Ireland. I made frequent inquiries about it, but could never hear of a single instance of its being used. The author of the Survey of Somersetshire (Mr. Billingsby) says: 'it is observable, that land on which rotted Flax is spread to prepare it for hackling, is greatly improved thereby, and if it be spread on a coarse sour pasture, the herbage will be totally changed, and the best sorts of grasses will make their appearance. Having myself cultivated Flax on a large scale, and observing the almost instantaneous effect produced by the water in which the Flax was immersed, I was induced, some years ago, to apply it to some pasture land, by means of watering carts similar to those used near London for watering the roads. The effect was astonishing, and advanced the land in value ten shillings per acre.'"

The chaff remaining after the scutching might also be formed into manure, and has actually been found of as much value as its composition would indicate. Thus, in fact, the farmer sending to market only the fibre of the Flax, which derives nothing from the soil, has the opportunity of economizing in other and highly remunerating modes all the residual materials.

This chaff was found to consist of

Carbon	50·34	Oxygen	41·52
Hydrogen	6·33	Ashes	1·57
Nitrogen	·24		
Total			100·00

Its nutritive quality cannot be material, but mixed with the water of the Flax-steep, it should complete the restoration to the soil of the constituents of the growing Flax.

The average produce of scutched Flax, as given by Wakefield, reduced to the statute acre, is 543 lbs. from nineteen gallons of seed. This is thirty-four stones of sixteen pounds. The usual produce of Scotland is stated by Low to be forty stones, and at present by the Reports of the Flax Improvement Society, the produce in the north of Ireland may be taken as averaging forty-two stones. The weight of the Flax straw, when quite dry, may be taken as approximating to about two tons.

Mr. Crosthwaite, whose intimate acquaintance with all branches of this industry renders his authority highly valuable, considers that there are about 100,000 acres under Flax in Ireland, and that the produce is about 30,000 tons, of an average value of £50 per ton. This is 6s. 3d. per stone, and should give about £12 10s. for the usual produce of the statute acre. The quantity of Flax grown appears to be on the increase, and its quality also to be improving, as by the Report of the Flax Society it appears, that the amount of the crop in 1841 was 25,000 tons, averaging £45 per ton, whilst in 1843 it was 36,465 tons, and the average value was considered to be at least £55. This increase of value being, if not wholly, certainly in great part, attributable to the exertions of that very useful Society.

Where so much depends on the mechanical and chemical treatment of the plant after the crop has been pulled, it is easily conceivable that under the ordinary circumstances of the Irish farmers, it is difficult to carry out the preparation of the fibre, so as to give it the best quality, and in fact in Belgium and Holland, where the Flax cultivation and manufacture are in their most advanced state, the growth of the plant and the fabrication of the fibre are totally distinct occupations. The crop is purchased by a factor, who takes the dressing into his own hands, and, being devoted to that one department, is acquainted with all mechanical arrangements and details necessary to success, and it frequently happens that the farmer actually obtains for the crop, as grown, more money than he should have obtained for the imperfectly dressed produce of it, and is spared the loss of time, of labor, and interference with other business, which, retaining the mechanical treatment of the Flax in his own hands should necessarily entail upon him. In the present state of industry, I conceive the general adoption of the system of factors as indispensable to progress. Without improvement in quality of product, the manufacture cannot extend, and without the preparation of the fibre being taken up and cultivated as a distinct profession, no important amelioration in it can be expected.

From the importance of the Flax culture, as well to the farmer as to the manufacturer, it might be supposed that it should be at least cultivated to such an extent as to supply our own industrial wants. Such, however, is far from being the case; every year a large quantity of Flax is imported into Great Britain and into Ireland from the Baltic ports, and from Belgium; the total quantities for three late years are shown in the following table:

WHENCE IMPORTED.	1840. Tons.	1841. Tons	1842. Tons.
Russia	43,520	48,472	40,720
Prussia	6,779	5,5[illegible]	5,624
Germany	405	519	815
Holland	5,650	6,024	4,828
Belgium	4,032	4,865	2,475
France	2,164	1,477	866
Other countries	99	478	385
Total tons	62,649	67,368	55,713

It is worth observing, that the diminished importation of 12,000 tons of 1842, is almost exactly the quantity by which, owing to the exertions of the Flax Improvement Society, the home crop had been increased at the same period.

The agricultural employment which the Flax crop gives, may be estimated from a statement by Mr. Blacker, whose ability as a judge is so well known; he says: "After the most minute calculation by practical men engaged in the growth of Flax, the labor necessary for every acre of Flax is computed to be seven days of a man, fifty-four days of a woman, and four and a quarter days of a horse. Now 55,610 tons, weight [which was the import in 1833, when Mr. Blacker wrote], supposing each statute acre to produce four cwt. which is a full average crop, would be the produce of 278,050 acres, which, according to the above estimate, would require in labor equal to the employment of 6,488 men for 300 days in the year, 50,015 women for the same number of days, and 3,939 horses for ditto."

It appears thus, that there is twice as much Flax imported into Great Britain from foreign ports, as there is grown in this country, and yet there is no actual impediment to its cultivation, for it appears to be uniformly a remunerating crop, where attended to with ordinary care, and

may, by the proper application of scientific principles to its culture, be rendered one of the least expensive or exhausting crops that the acriculturist can have to do with.

There is finally to be noticed, in relation to the secondary advantages of the Flax crop, the utilization of the seed, either as food or for sowing. It appears now well established, that the fibre is not injured by allowing the plant to form the seed,* and that the seed may be saved in good condition under the ordinary circumstances of our climate. This is a very important addition to the value of the crop: the seed being employed for preparing oil; the residual linseed cake being a very valuable food for cattle, or for manure; or the unripened seed in the capsules, or bowes, as they are termed, may be at once given to cattle. The husks of the seed vessels have been used as food for cattle in the north of Ireland, and by the testimony of Mr. Nevin, and of Mr. Charley, with remarkable advantage. In fact, it would appear that there is no part of this very remarkable plant that is not directly or indirectly capable of being applied to useful purposes.

The great value of it to this country is, however, that its cultivation supplies not merely a source of agricultural, but also of manufacturing employment. In this respect, it is far more beneficial than a food crop of the same money value, or occupying the same ground. The flax, as it leaves the hand of the farmer, gives a livelihood to the dresser, from him it passes to the spinner, to the weaver, the bleacher, and perhaps to the embroiderer, according to its destination. Mr. Andrews illustrates the actual profit and employment given by the crop described page 331, in a calculation which, after correction of a few typographical errors, stands thus:

"100 stones at 15s.—£75; each stone calculated to produce 5½ lbs. of *dressed* Flax—in all 550 lbs.—spun to 30 hanks to the lb., will produce 16,500 hanks. About 158 females will be employed twelve months in spinning, at the rate of two hanks per week (six working days); wages for spinning each hank, about 1s. 8d., or nearly 7d. per diem for each spinner. This quantity of yarn would make 210 webs of cambric pocket-handkerchiefs, each web containing five dozen. About 18 weavers would be twelve months weaving this quantity, allowing each man a month for each web (17½ weavers exactly); wages per web, £2; or from 9s. 6d. to 10s. per man per week. About 40 females would be employed twelve months in needlework (hemstitch or veining); each could do *one* handkerchief on each working day; wages 8s. per dozen, or 8d. per day. The goods, when finished, would be worth £2 10s. per dozen.

158 spinners 12 months, or 52 weeks, at at about 3s. 4d. per week	£1,369	6	8
18 weavers 12 months, at £24 per ann.	432	0	0
40 needlewomen 52 weeks, at 4s. each per week	416	0	0
216 persons employed.			
Amount of wages	£2,217	6	8
Cost of Flax	75	0	0
	£2,292	6	8
Value 1,050 doz. hdkfs, at £2 10s. pr doz.	£2,625	0	0
Profit	£332	13	4

* But the cloth from seed Flax must be bleached chemically, and for certain goods subject to great exposures, as canvass, this is objected to throughout the world. [*Ed. Farm. Lib.*

The realizing of this great amount of value depends on the delicacy given to the fibre, and it is hence that so much is due to the leading members of the Flax Society, for their exertions by example and by publications, for the introduction of the most approved Belgian methods. While thus recognizing the benefits which are likely to accrue to Irish industry from this modern institution, it is important not to forget how much we owe to others. The Royal Dublin Society, almost immediately on its foundation, applied itself anxiously to promote the culture of Flax, and to improve the methods of its preparation. They obtained the assistance of persons well experienced in the Belgian processes, and so early as 1739 published a volume of papers, principally occupied with directions for the growth and treatment of Flax, and which contained, intelligibly laid down, almost every detail of the processes now being introduced as the newest and most advantageous. Owing to the disastrous social condition of the country, which has so kept it back in every branch of peaceful enterprise, the beneficent intentions of the Royal Dublin Society were not carried out, but now that with renewed energy, it labors to awaken Irish industry, that it possesses in numerous junior societies so many active coöperators, and that the people, by education and steadiness of habits, are become more fitted for the pursuits of peaceful industry, it is to be hoped that the seed shall no longer be scattered upon an unfruitful soil, but spring forth with a sound and vigorous vegetation, which may bring peace, abundance and contentment to the land.

It only remains to indicate, in a general manner, the extent to which the mechanical manufacture of Flax is prosecuted in this country. In the work on Ireland, published by Mr. and Mrs. Hall, some statistical results are given, which they obtained by personal inquiry in Belfast, and which, though probably above the truth, are not more exaggerated than is usual with such general estimates. They consider that there are in Belfast, now at work, 155,000 spindles, consuming 210 tons of Flax per week, and that there are employed in the manufacture of Flax, 170,000 hands. They estimate the total number of persons supported by the linen trade as not less than half a million; that the annual value of the linen cloth manufactured in Ulster is not less than £4,000,000: the capital involved in its production not less than £5,000,000, and that the annual amount of wages paid to those engaged in the manufacture amounts to £1,200,000. This sum, for the 170,000 above mentioned, would make the average wages to be only 2s. 9d. per week.

The extent of this manufacture stands in such relief from the usual absence of all manufacturing industry in Ireland, that we frequently attach to it a degree of importance and an idea of absolute magnitude that it does not really possess. Thus we often hear the linen manufacture spoken of as being the staple of this country, whilst wool and cotton are in return the natural manufactures of the sister kingdom. In reality, however, Ireland is almost as much behind in this as in every other branch of industry. The town of Dundee alone is considered to manufacture as much linen as all Ireland, and the relation which the manufacture of Flax bears in the three kingdoms is exactly shown in the following table, which is extracted from the Report of the Factory Inspectors for 1839,

since which period no sensible alteration has taken place.

In England there were 169 mills, worked by 4,260 horse power, and employing 16,573 persons.

In Scotland 183 mills, worked by 4,845 horse power, and employing 17,897 persons.

In Ireland 40 mills, worked by 1,980 horse power, and employing 9,017 persons.

It is difficult to reconcile this official return with the estimate of Mr. Hall, just before quoted; as the proportion of home-spun and woven linen goods can scarcely be so considerable as to account for the discrepancy.

Finally, the following extracts from official tables will show, as far as documents allow, the actual, or at least recent, extent of the export trade in linen products.

EXPORT OF WOVEN LINEN GOODS, IN YARDS.

Years.	*To Great Britain.*	*To Foreign parts*	*Total.*
1810	32,584,545	4,313,725	36,898,270
1815	37,986,359	5,496,206	43,482,565
1820	40,318,270	3,294,948	43,613,218
1825	52,559,678	2,553,587	55,113,265

RE-EXPORT OF IRISH LINEN AND SAIL-CLOTH, FROM GREAT BRITAIN TO FOREIGN PARTS, IN YARDS.

Years.	*Irish Linen.*	*Irish Sail Cloth.*
1824	17,933,195	1,593,291
1827	14,022,496	2,211,529
1830	13,244,269	1,922,211
1833	9,561,277	2,229,777

Latterly an extensive trade with the Continent has sprung up, in the exportation of linen yarns, replacing, to a certain extent, the export of woven linens. The money values exported were

Years.	*Linen.*	*Yarn.*
1837	£77,272	£3,164
1840	63,847	172,602
1842	31,404	169,449

Such are the general conditions of this important branch of manufacture. It is needless for me to point out how strenuously our efforts should be directed to the extension of a branch of industry which, in its various departments, affords, from a given surface of land, employment to a greater number, and a greater variety of individuals, than any other branch of human occupation. The agriculturist, the mechanist, and the chemist, are all equally occupied with its preparation; and, certainly, the natural circumstances of the country are such as to adapt it, in a singularly perfect manner, for the development of the flax and linen manufacture, to an indefinite extent.

The linen manufacture has been, hitherto, almost exclusively confined to the north of Ireland. This does not arise from any physical circumstances of soil or climate, or from the greater facilities of access to mechanical power; on the contrary, the soil of Ulster, if we except the valley of the Lagan, and some scattered districts, is not, by any means, equal to the soils of the south and centre. The growth of this department of industry in Ulster, is owing rather to moral causes. Its population was, essentially, of a class devoted to industrial pursuits, and eager after the independence and power which pecuniary success confers, and which was within their reach; whilst in the south, the wretched remnants of feudal barbarism paralyzed all tendency to improve. The lord was above industry; the slave was below it; and hence, although the circumstances of a fertile soil, easy access to markets, and abundance of motive power, were, in themselves, favorable, the blessings which nature presented were left unutilized, by the ignorance and inertness of the people.

In fact, if we consider the situation of those countries in which the manufacture of linen and other Flax products has become the characteristic fact of their industrial history, we shall find the soil and geographical condition quite different from those of the north of Ireland. In Egypt, whose dignitaries were clothed in purple and fine linen, and from which the culture of Flax has spread over the civilized world, the soil was formed by the mud carried down in the overflowings of the Nile, and spread over the surface of the lower country along its banks. The soils of Belgium and Holland, the countries now most remarkable for the excellence and abundance of their Flax industry, have been produced by the accumulated mud deposited by the vast rivers, which, draining the greater part of Europe, discharge their waters into the German Ocean, by numerous channels. The rivers which flow into the Baltic afford, also, on the low grounds along their banks, the seats of the Flax Agriculture of Russia and Northern Prussia; and, guided by these analogies, may we not ask, where are the similar soils, or districts, in our own country? They are abundant and available along the line of the principal river. The lands hitherto liable to flood, by the irregular risings of the Shannon, but, by the improvement of its channel, about to be permanently rendered available to Agriculture, amount to not less than 32,500 acres above Limerick, whilst below that city, the caucasses, or marshy grounds, of the extraordinary fertility mentioned by Wakefield, are to be found. Such soils afford the most complete parallel to those districts of Egypt and of Belgium, which have been for ages the seats of the growth of Flax. The water power at Killaloe, fully described before, places at the hands of the manufacturer, the means of every mechanical preparation of the crop. The river furnishes for 200 miles the most convenient access to domestic markets, and the port places him under equally favorable circumstances for the foreign trade. So remarkable a combination of facilities for industrial success is rarely to be met with.

The Flax had formerly been actually cultivated to some extent in certain parts of the south and centre of Ireland, and the quantity of produce obtained was found decidedly greater than the average of the crops given in the north of Ireland. I am informed by experienced persons, also that the quality of the fibre was of a delicacy but seldom met with in the ordinary Flax of Ulster. Neither the cultivation nor the manufacture was adopted by the people with the energy and patience which alone can lead to success. The encouragement to industry was unhappily associated with other objects, which deprived it of all power of really bettering the condition of the people; which interposed between those who might have served as efficient teachers, and those who were to derive instruction, a barrier which, it is to be hoped, the experience of centuries has at last shown cannot be removed by measures of cruelty or menace.

Connected with the cultivation of Flax, as a department of Agriculture, and of subsequent

mechanical industry, is that of hemp, which, in all its states, indeed, bears an almost perfect analogy to the growth and preparation of Flax. During the war, when access to the Baltic, whence the great supply of Hemp is drawn, was difficult, this plant was cultivated in this country with some success. The crop appears to require a good soil, and in its preparation a degree of care which the general run of farmers were not capable of applying to it, and hence, since that period, the attention of agriculturists having been exclusively fixed on corn and other food crops, its cultivation has been totally abandoned.

The constitution of the Hemp plant is almost exactly like that of Flax. It is pulled, with suitable care in regard to the ripening of the seed, which its diœcious structure requires. The plants are steeped, until the gummy material which connects the fibres is softened and rotted off, and then, after drying and a certain amount of bleaching on green land, the fibrous skin is peeled from the stems, and the fibre obtained clean by scutching with appropriate instruments. The Hemp fibre, like the Flax fibre, consists of purely woody matter, having the chemical composition of $C_{18}\ H_{12}\ O_{12}$, and contains neither nitrogen nor saline matters. It is hence formed in the plant by the agency of the atmosphere alone, and the materials which the plant extracts from the soil, or from the manure used in its cultivation, are found, not in the fibre, but in the waste of the processes of its preparation. The water in which it had been steeped, the chaff which remains when the fibre is cleaned off, contain various substances, which, when properly returned to the soil, give it back all that the plant in growing had removed from it, and hence would restore its original condition of fertility. In this way the Hemp may, like Flax, be rendered one of the least exhausting crops, and the profit on its cultivation increased, of course, in the same proportion.

In order to establish these principles by chemical analyses, I instituted an examination of the Hemp plant and its products, analogous to that which has been already noticed regarding Flax. The following were the results. The Hemp plant consists of:

	The Stem.	*The Leaves.*
Carbon	39·94	40·50
Hydrogen	5·06	5·98
Oxygen	48·72	29·70
Nitrogen	1·74	1·82
Ashes	4·54	22·00
Total	100·00	100·00

The ashes of the plant (stem and leaves), consisted of:

Potash	7·48	Silica	6·75
Soda	·72	Phosphoric acid	3·22
Lime	42·05	Sulphuric acid	1·10
Magnesia	4·88	Chlorine	1·53
Alumina and oxide of iron	·37	Carbonic acid	31·90
Total			100·00

When the Hemp is steeped, the water acquires very strongly narcotic properties and a disagreeable odor. On drying it down a brown extract is obtained, which was composed of:

Carbon	28·28	or	55·66
Hydrogen	4·16	or	8·21
Nitrogen	3·28	or	6·45
Oxygen	15·08	or	29·68
Ashes	49·20	Without the ashes	
Total	100·00		100·00

This material contains so large a quantity of nitrogen, as well as of saline matters, as to show that when it had decomposed it should become a most valuable fertilizer.

The steeped Hemp stem, as it remains after pulling off the loose fibrous coat, is little more than ordinary wood. It contained:

Carbon	56·80	Oxygen	34·52
Hydrogen	6·48	Ashes	1·77
Nitrogen	0·43		
Total			100·00

The cultivation of the Hemp is not likely to be in future as important as hitherto it has been. The substitution of iron for Hemp in the standing rigging of ships, and the introduction of coarse Egyptian Flax in the manufacture of various fabrics where previously Hemp had been used, will probably limit very much its consumption. It is only from its close analogy to the Flax, and the identity of principle by which so much economy may, as I believe, be introduced into the cultivation of both, that I have here noticed it, even thus briefly.

I have endeavored, in the foregoing observations, to notice briefly the questions regarding Irish Agriculture, which appeared to me most intimately connected with its position as an important branch of industry. It has been shown that the amelioration of the processes of cultivation requires a very extended knowledge of chemical and mechanical science. That husbandry as an art, so far from presenting the monotonous and almost passive routine in which rustic existence has been dreamed away, requires to be placed parallel with the other great departments of human occupation, in the amount of intelligence which its successful practice calls into play.

Until, by suitable education, the minds of the agricultural population of all classes are awakened to a knowledge of what their art really depends upon, all secondary exertions for its improvement must be completely futile.

There exist in Ireland millions of acres of land perfectly well adapted for cultivation, but which have never yet supplied a morsel of food for man.

It is well established that on the lands actually cultivated there might be raised three times the amount of food that is now produced, were a suitably improved system of Agriculture brought into general use.

And yet there exists in Ireland a population starving and unemployed, wearing out a miserable existence on the charity of those only a degree less wretched than themselves, or supported by a tax levied on the industry of the more energetic and more instructed classes.

Were the true conditions of agricultural success generally understood, such could not be the case. The cultivation of these wastes, which, as evidence of the most decisive and practical character has shown, can be easily and economically reclaimed, would give remunerative occupation to hordes of those who now are among the weightiest burthens of the land. The productiveness of the soil being augmented by proper drainage and deep working, and the pastoral system replaced by the turnip and green crop husbandry, by which so much more food is raised and so much more employment given, it would be found that, so far from the existing numbers of the people being too great to be supported by the soil, the new conditions of agricultural activity would provide means of profitable occupation for a much greater number than that proportion of our population which can, even now, be considered as dependent on it for the means of life.

ONE-HORSE CARTS.

BY EDWARD BOWLY, SIDDINGTON, NEAR CIRENCESTER.

PRIZE ESSAY.......From the Journal of the Royal Agricultural Society of England.

HAVING had five years' practical experience in the use of wagons, and nearly the same time of one-horse carts, on a farm of 170 acres of arable and 80 acres of pasture land, I have arrived at a satisfactory conclusion as to the comparative advantages of the latter. I will, as briefly as possible, point out what I consider to be those advantages.

We must first consider the saving of capital in entering a farm by employing one-horse carts instead of wagons. From the great variety of soil it is difficult to form a just estimate of the amount of horse-power required to cultivate a given quantity of land. We may, however, to a certain extent do so by taking for our purpose land of medium quality, of which description my own farm consists. I have no light plowing land, nor have I more than 20 or 30 acres of very heavy land. I will, therefore, relate my actual experience. In the employment of wagons and the old broad-wheeled dung-carts, I required one wagon, one cart, and three horses to every 50 acres of arable land. I also kept a light cart for general purposes. Now that I am employing carts, I find that I get through my work much more easily with two horses and two carts to 50 acres. The following is a fair calculation of the first outlay under the two systems:—

1 wagon	£25 0 0
1 dung-cart	15 0 0
3 horses	60 0 0
Extra harness	2 0 0
Proportionate cost of the light cart to 50 acres	3 0 0
Total	105 0 0
Two 4-inch wheel one-horse carts	£25 0 0
Two horses	40 0 0
	64 0 0
Balance in favor of carts	41 0 0
Total	105 0 0

This shows a saving of upwards of 16s. an acre, which many young farmers would find extremely useful to expend in stock or implements. There is also some annual saving in the expense of the repairs under the cart system, as well as that of the keep of one horse to every 50 acres. I believe there are those who think this of little importance; that they can keep horses at a very small expense, say from 3s. to 5s. per week; and that if fewer are kept, they must be fed more highly, and therefore the cost is much the same, forgetting that the more horses are kept the greater number of hands are required to attend them, whose time also is wasted if the animals are not in a state to do a good day's work; nor is the manure nearly so valuable as when the horses are kept in a better state. To estimate the saving of keeping one horse less to 50 acres, I will make my calculations from my own method of keep. I have not for years allowed my horses any hay. In winter I give them 10 lbs. of corn, [meaning oats or barley] 10 lbs. of carrots or swedes, and as much straw-chaff as they will eat, per diem. The corn I value at 6s. per week, the roots at 9d., and the straw with expense of cutting into chaff 1s. 3d., making in the whole 8s. per week, which, with 1s. for shoeing, &c., amounts to 9s. [or $2 25.] In the summer I give them green clover or vetches, without corn, which I value at 5s. per week, making 6s. with 1s. added for shoeing, &c.; the average therefore for the whole year will be 7s. 6d. each horse. It therefore follows that if we can save one horse in the cultivation of 50 acres, it will amount to nearly 8s. per acre.

I will now proceed to the working of the system. It is, I believe, generally admitted that one horse attached to a given weight, will move it more easily than two horses attached to double that weight. This arises not only from the advantage gained by having all the power of draught close to the work, but also all the power applied at the same moment, which is almost impossible where two or more horses, having different wills and steps, are attached to the weight; and for the same reason one horse will travel more quickly singly. I have often heard it remarked as teams have passed "how well the horses pull together," when, perhaps, they have been moving at something less than two miles an hour; but hasten them to four miles an hour, and this steady working team will draw very uneasily, one horse pulling to the right hand, another to the left; therefore a great saving of time is occasioned in the quickness of motion with one horse carts. When a cart is filled there is no delay in attaching the trace-horses, during which operation the one horse would be two hundred yards on the road. I know this might be done more quickly by having men ready to change the horses, as is the practice of opposition coaches, but I am speaking of the matter-of-fact working of the system. Then again, when the load is deposited, the one horse turns in much less time than the two or three. These facts are too self-evident to admit of contradiction; indeed, I believe the economy of carting manure with one-horse carts is generally allowed, but the employment of them in harvesting is much objected to. In this respect, however, I find them equally expeditious and economical. My actual experience is that three carts, with the harvest frames attached, will convey as much hay or corn in the straw as two wagons, and that they are bound with the ropes in the same time, therefore no time is lost in

binding. They are easier to pitch to than wagons, and not more difficult to unload; and all the advantages are gained of speed in traveling.

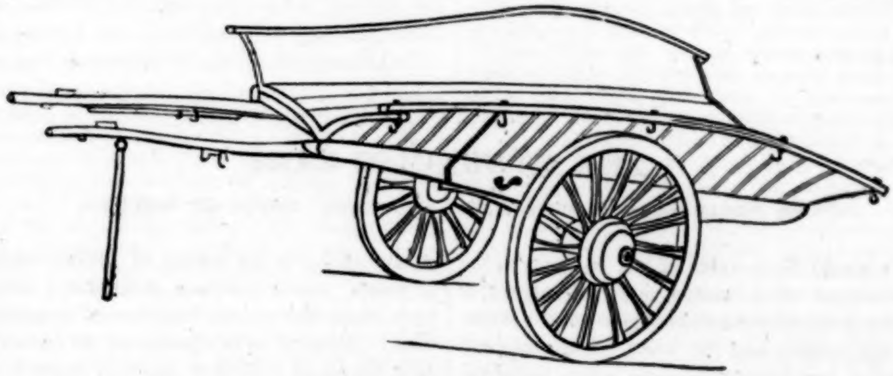
The facility with which carts are set to a rick, as compared with wagons, will effect a much greater saving of time than in working from a heap of manure; you can also draw the carts to all sides of the rick, thereby avoiding the inconvenience of drawing your rick aside by the great treading there generally is on the side on which you unload the wagons, the usual practice being to unload all on one side, from the wagon being too unwieldy in turning to be set at the other sides. My system in carrying a field, what we call "double handed"—that is, with two pitchers and two loaders—is to commence with one cart, having one pitcher and loader, and when that is half loaded to start another with the other pitcher and loader.—When the first is filled it goes to the rick, and is followed by the others in succession: by commencing in this way we keep on regularly through the day, having two carts loading in the field and two unloading at the rick, and the number of carts employed in going to and fro must be regulated by the distance of the field from the rick; if very near, one will be sufficient, and more than two are seldom required on any farm of moderate dimensions. I conceive it would not be generally useful to mention the time occupied in securing a given number of acres of corn with carts, as so much depends on the bulk of the crop, as well as the power of the men employed. I once accurately remarked the time of such an operation: it was in carrying a very heavy crop of 10 acres of *mown* wheat close to the homestead, which took with five carts four hours and a quarter from the first cart entering the field to the finishing off the rick with the last. The longer the distance of the field from the rick the greater will be the advantage of carts. Supposing each wagon to be drawn by two horses (three are frequently employed,) and that three carts will convey as much as two wagons, which I am certain will be more than borne out in practice; then three horses will take as much in the carts as four in the wagons, and they will perform the distance in little more than half the time. It is supposed that an additional expense attends carts in the number of boys required to go with them: this is not the case; the boys are younger and less expensive than those intrusted with wagons, and the horses do not need any boy in the field, as when they become accustomed to their work they will walk steadily beside the cocks without being attended. There is an impression that carts will not answer in hilly situations; we find, however, they are employed, to the exclusion of wagons, in some of the most hilly counties of England. I have certainly nothing very steep on my farm; but 50 acres lie nearly two miles from the rest of my land, on which road there are two very sharp pitches, up and down which I am constantly taking loads, and have never found more inconvenience with carts than I formerly did with wagons. But, to prevent any possibility of accident, there is now to be had the self-acting drag, which retards the wheels in proportion to the descent; there is also a very simple method of moving the load forward by means of a screw when going up hill, and backward in descending a hill. But I have found the carts I have answer so well without these additions, that I shall not go to the expense of either of these improvements at present. In taking out corn in the sacks, carts will be found far preferable to wagons, as in all the other operations carrying a greater weight with the same ease and in less time, each cart carrying 5 quarters of wheat. Nearly the whole of my wheat goes to a mill seven miles distant, on the road to which there are three steep hills. I always send two carts, carrying five quarters of wheat each, with one lad of eighteen or twenty, going twice a-day; and in summer, when the roads are very good, I have put 5½ quarters behind each horse: thus two horses would deliver 22 quarters in a day.

I have endeavored to answer all the objections I have heard used against one-horse carts, objections which I once strongly felt myself.—My attention was first drawn seriously to the subject from hiring a man to draw some stones for draining. He came with a horse only 14 hands high and a small cart, when the work he accomplished so surprised me, that I at once decided to try two light carts, which, after succeeding well in all other operations, I employed in the harvest field; and being fully satisfied with them in this capacity, I soon discarded every wagon from the farm.

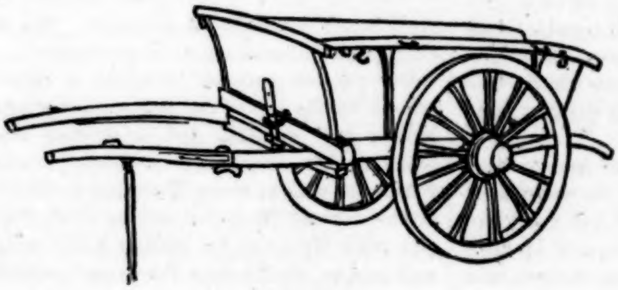
I have carefully endeavored to give a just estimate of the saving in horses and implements by the use of carts; since they were first employed by me I have effected a greater reduction in the number of each than is here represented. When I kept wagons I had not so much land by 20 acres in cultivation as at present; I then kept ten horses, four wagons, three dung carts, and one light cart; I now only keep six carts and six horses. I, however, attribute a portion of the saving to the use of the scarifier in many instances instead of the plow, and I now very rarely put more than two horses to a plow, while at that time I frequently had three; on the other hand, for two years past, I have each year carted 150 loads of night-soil a distance of a mile and a half, and 300 loads of road-scrapings, &c. half a mile, which is two-thirds more than I did during the time I had wagons. I have also done each year the following extra work:—carted 30 tons of potatoes two miles, 60 tons of roots half a mile, subsoil plowed 6 or 7 acres, and carted stones for 15 acres of draining 30 feet distant. I have therefore taken all these things into due consideration, and given the fairest representation in my power.

The description of carts I make use of are, five common Scotch carts and one skeleton cart; those of the former, with narrow wheels, cost me 10 guineas each; and with the 4-inch wheels (which I recommend) £12, with harvest-frame, &c. complete. The skeleton with narrow wheels cost me £10; it will carry more hay or straw than the others, its loads being in proportion of four carts to three wagons—it is more convenient for conveying poles, hurdles, &c.; and one on a farm may be useful, but it will not answer in dung-carting, and its advantages in harvesting are not sufficient to remunerate for the additional outlay of a double set.

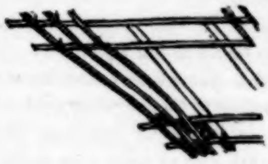
In conclusion, I may remark that the principle of one-horse carts is quickness of motion, therefore load according to the road to be passed over, but never reduce the pace of traveling; and I can assure those who are timid about them, that they are much less liable to accidents of every kind than wagons; and that, however prejudiced the workman may be against their first introduction, when he becomes acquainted with the system he will prefer it.



Skeleton Cart.



Scotch Cart.



Harvest Frame.

A Hint for Agricultural Societies.—We respectfully suggest to the American Institute, and to all Agricultural Societies, that they could not better employ a portion of their funds than by offering liberal premiums to all venders of Agricultural Machinery and of Fruit Trees, Seed, &c. and yet more to individuals not in "the trade," who shall be the first importers and exhibiters of any implement, seed, grain, grass, fruit or ornamental tree, which by a committee of practical men of the Society shall be deemed a valuable acquisition to the country.

We want now a *Hand Seed-Depositor*, lately invented in England, which will deposit the seed at any required depth and distance, and in any required number; and which costs only a few shillings. We want the *St. John's-Day Rye*, unless it be, as we suspect, nothing more than the Multicole Rye, which we have had already; the seed of the "*Gold of Pleasure*"—all of which have been before mentioned in the Farmers' Library—but unfortunately it's every body's business and nobody's to import them. Let liberal premiums be offered, or let a sum be set apart and a committee of importation be appointed, to send for such things as hold out a promise of *practical usefulness*.

Gold of Pleasure.—I shall be obliged to you to inform me whether you or your correspondents know any thing of the Camelina sativa or Gold of Pleasure. It is said to have great fattening properties for sheep and cattle, and I know it to be most productive, from having tried a very small quantity of seed this summer. A farmer near Somerton sowed 3½ lbs. of it, and his son tells me that the produce was 600 cwt. and upwards. It is said to produce an excellent oil. It may be sown on poor land.

George Rous, Laverton, Beckington.

Agriculture in France.—France has of late years pursued a wise, judicious, and liberal policy in regard to her Agriculture. In 1838, there were in that country 123 Agricultural Societies, and 303 Agricultural Committees. Scarcely a movement which could contribute essentially to her husdandry, has been neglected. Pecuniary encouragement to a very great extent is afforded, and agents are sent into other countries, at the expense of the French Agricultural Society, in order to examine their systems of farming, with a view to the more perfect practice of the art at home. In 1803, there were scarcely ten organized Societies in the kingdom. They are now, however, rapidly increasing.

[Genesee Farmer.

THE HYDRAULIC RAM;

OR CHEAP METHOD OF HAVING A CONSTANT SUPPLY OF WATER.

It would be a waste of ink to dwell on the advantages of a constant and full supply of water about the homestead of every man's estate, in the country, and yet every reader may call to mind numberless instances where incalculable inconvenience and privation have been endured, and the most prodigal waste of labor committed from generation to generation, from that *vis inertiæ*, that physical and moral lethargy of character, which too often leads us to drag on through life, neglecting expedients that the least thought would suggest, and the slightest exertion bring to our relief.

For years and years have we known large families to be supplied with all the water needed, or rather all that was used, but not a hundredth part of what was really *needed*, by keeping young persons constantly on the trot, to an unclean spring, sometimes at the distance of half a mile, bringing on their heads pails or "piggins" full at a time, when a cistern of simple construction made tight with water-cement, eight or ten feet in diameter and depth, would collect rain-water enough from the roof of the barn or the dwelling to give a constant supply of drinking water of the very best kind when filtered and iced. Again we have known, may it not be seen every day, where streams of water of the smallest volume might, with a very simple hydraulic contrivance, as we shall show, be made to afford a constant flow of pure water at the door of the kitchen, the dairy, and the stable.

So highly is the luxury of abundant water esteemed in this City, that in almost every house that is built, it is only necessary to turn a cock to have it at pleasure in every room and chamber.

Not aware of any thing more interesting to the Farmer, than the means of having at all times a full supply of water, not only for pur poses strictly domestic, but for the use of all his domestic animals and for irrigation in our dry climate, we shall bring to the use of our patrons all the information we can collect, as to the various contrivances which may be resorted to for that purpose—we know how apt they are to be deterred from attempting any thing out of the common track, on account of the supposed or actual expense in the first instance, but a simple calculation of the remuneration to be derived from the saving of labor, and the money value, to say nothing of the luxury, of a fuller supply of water, would convince them that a single year, some times even less, would reïmburse them. There is to be considered, for example, as to the use of it for their domestic animals, not only the time that is saved, through the whole winter especially, in sending them to a distance to drink, but that they often suffer from not having a supply when Nature demands. The saving of manure too is not to be overlooked.

Our present purpose, however, is only to transfer for the use of our readers a few pages from a very valuable and interesting work, which ought to be added to the Library of every Farmer as well as every Mechanic, entitled "A descriptive and Historical account of Hydraulic and other Machines *for raising water*, ancient and modern, by Thomas Ewbank," published in 1842 by D. Appleton & Co.

Although, according to this diligent and discriminating author, "the art of raising water, has ever been closely connected with the progress of civilization, so much so indeed, that the state of this art among a people may be taken as an index of their position on the scale of refinement, it seems passing strange that until this entertaining and instructive work made its appearance so recently, no one publication had ever been devoted to the great variety of devices which human ingenuity has devised for raising liquids.

Dry as may seem to be a history of *water*-lifting devices, we hardly know a book from which more curious and refreshing drafts of information might be made, than from this one by Mr. Ewbank, yet now we have not room to spare for that purpose, even if we could venture under any circumstances to give up for mere amusement, pages which can only be so used when amusement may be blended with obvious utility. Accordingly, we can only appropriate at present space for extracts explanatory of the principles and construction of the Hydraulic Ram of *Montgolfier*, which, as will be seen, may be adapted to every location in the country where there is the smallest stream of running water. How many farmers are there who have this invaluable resource unemployed, and who, by placing this paper in the hands of any honest ingenious mechanic, might at small expense have a perennial flow of water at his dwelling and barn-yard, for cooking, washing, bathing,

for watering his poultry, his stock, his dairy and his garden, and for a thousand uses that would suggest themselves, were the water at hand?

Of the machines appropriated to the fourth division of this work, centrifugal pumps and a few others have already been described. There remain to be noticed, the water ram, *canne hydraulique*, and devices for raising water by means of steam and other elastic fluids.

If the various operations of the lower animals were investigated, a thousand devices that are practiced by man would be met with, and probably a thousand more of which we yet know nothing. Even the means by which they defend themselves and secure their food or their prey, are calculated to impart useful information. Some live by stratagem, laying concealed till their unsuspecting victims approach within reach—others dig pitfalls to entrap them; and others again fabricate nets to entangle them, and coat the threads with a glutinous substance resembling the bird-lime of the fowler. Some species distill poison and slay their victims by infusing it into their blood; while others, relying on their muscular energy, suffocate their prey in their embraces and crush both body and bones into a pulpy mass. The tortoise draws himself into his shell as into a fortress and bids defiance to his foes; and the porcupine erects around his body an array of bayonets from which his enemies retire with dread. The strength of the ox, the buffalo and rhinoceros is in their necks, and which they apply with resistless force to gore and toss their enemies.—The elephant by his weight treads his foes to death; and the horse by a kick inflicts a wound that is often as fatal as the bullet of a rifle; the space through which his foot passes adding force to the blow.

There are numerous proofs of some of the lower animals being aware that the momentum of a moving body is increased by the space through which it falls. Of several species of birds which feed on shell fish, some, when unable to crush the shells with their bills, carry them up in the air, and let them drop that they may be broken by the fall. (The Athenian poet Æschuylus, it is said, was killed by a tortoise that an eagle dropped upon his bald head, which the bird, it is supposed, mistook for a stone.) When the males of sheep or goats prepare to *butt*, they always recede backwards to some distance; and then rushing impetuously forward, (accumulating force as they go,) bring their foreheads in contact with a shock that sometimes proves fatal to both. The ancients, perhaps, from witnessing the battles of these animals, constructed military engines to act on the same principle. A ponderous beam was suspended at the middle by chains, and one end impelled, by the united efforts of a number of men at the opposite end, against walls which it demolished with slow but sure effect. The battering end was generally, and with the Greeks and Romans uniformly, protected by an iron or bronze cap in the form of a ram's head; and the entire instrument was named after that animal. It was the most destructive of all their war machinery—no building, however solid, could long withstand its attacks. Plutarch, in his life of Anthony, mentions one *eighty feet* in length.

The action of the ram is familiar to most people, but it may not be known to all that similar results might be produced by a liquid as by a solid—that a long column of water moving with great velocity might be made equally destructive as a beam of wood or iron—yet so it is. Waves of the sea act as water-rams against rocks or other barriers that impede their progress, and when their force is increased by storms of wind, the most solid structures give way before them. The old light-house on the Eddystone rocks was thus battered down during a storm in 1703, when the engineer, Mr. Winstanley, and all his people perished.

The increased force which water acquires when its motion is accelerated, might be shown by a thousand examples: a bank or trough that easily retains it when at rest, or when slightly moved, is often insufficient when its velocity is greatly increased. When the deep lock of a canal is opened to transfer a boat or a ship to a lower level, the water is permitted to descend by slow degrees: were the gates opened at once, the rushing mass would sweep the gates below before it, or the greater portion would be carried in the surge quite over them—and perhaps the vessel also. A sluggish stream drops almost perpendicularly over a precipice, but the momentum of a rapid one shoots it over, and leaves, as at Niagara, a wide space between.—It is the same with a stream issuing from a horizontal tube—if the liquid pass slowly through, it falls inertly at the orifice, but if its velocity be considerable, the jet is carried to a distance ere it touches the ground. The level of a great part of Holland is below the surface of the sea, and the dykes are in some parts thirty feet high; whenever a leak occurs, the greatest efforts are made to repair it immediately, and for the obvious reason that the aperture keeps enlarging and the liquid mass behind is put in motion towards it; thus the pressure is increased and, if the leak be not stopped, keeps increasing till it bears with irresistible force all obstructions away. A fatal example is recorded in the ancient history of Holland:—An ignorant burgher, near Dort, to be revenged on a neighbor, dug a hole through the dyke opposite the house of the latter, intending to close it after his neighbor's property had been destroyed; but the water rushed through with an accelerating force, till all resistance was vain, and the whole country became deluged. The ancients were well aware of this accumulation of force in running waters. Allusions to it are very common among the oldest writers, and various maxims of life were drawn from it. The beginning of strife, says Solomon, "is as when one letteth out water"—the "breach of waters"—"breaking forth of waters"—"rushing of mighty waters," &c. are frequently mentioned, to indicate the irresistible influence of desolating evils when once admitted.

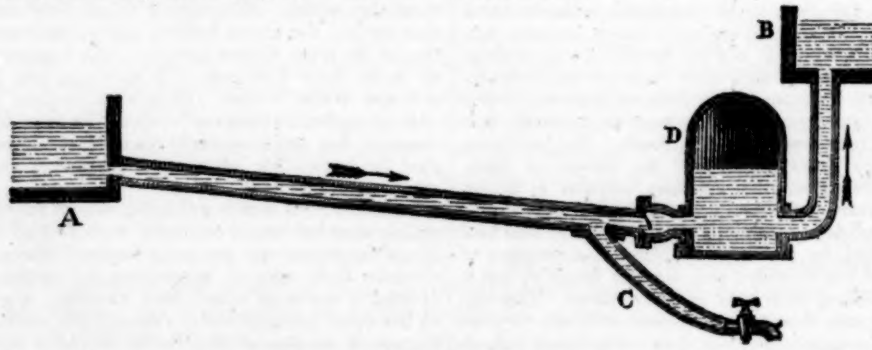
That the force which a running stream thus acquires may be made to drive a portion of the liquid far above the source whence it flows, is obvious from several operations in nature.—During a storm of wind, long swelling waves in the open sea alternately rise and fall, without the crests or tops of any being elevated much above those of the rest; but when they meet from opposite directions, or when their progress is suddenly arrested by the bow of a ship, by rocks, or other obstacles, part of the water is driven to greater elevations. There is a fine example of this at the Eddystone rocks—the heavy swells from the Bay of Biscay and from the Atlantic, roll in and break with inconceivable fury upon them, so that volumes of water are thrown up with terrific violence, and the

celebrated light-house sometimes appears from this cause like the pipe of a fountain enclosed in a stupendous *jet d'eau*. The light-room in the old light-house was sixty feet above the sea, and it was often buried in the waves, so immense were the volumes of water thrown over it.

The hydraulic ram raises water on precisely the same principle: a quantity of the liquid is set in motion through an inclined tube, and its escape from the lower orifice is made suddenly to cease, when the momentum of the moving mass drives up, like the waves, a portion of its own volume to an elevation much higher than that from which it descended. This may be illustrated by an experiment familiar to most people. Suppose the lower orifice of a tube (whose upper one is connected to a reservoir of of water) be closed with the finger and a very minute stream be allowed to escape from it in an upward direction—the tiny jet would rise nearly to the surface of the reservoir; it could not, of course, ascend higher—but if the finger were then moved to one side so as to allow a free escape till the whole contents of the tube were rapidly moving to the exit, and the orifice then at once contracted or closed as before, the jet would dart far *above* the reservoir; for in addition to the hydrostatic pressure which drove it up in the first instance, there would be a new force acting upon it, derived from the *motion* of the water. As in the case of a hammer of a few pounds weight, when it rests on the anvil it exerts a pressure on the latter with a force due to its weight only, but when put in motion by the hand of the smith, it descends with a force that is equivalent to the pressure of perhaps a ton.

Every person accustomed to draw water from pipes that are supplied from very elevated sources, must have observed, when the cocks or discharging orifices are suddenly closed, a jar or tremor communicated to the pipes, and a snapping sound like that from smart blows of a hammer. These effects are produced by blows which the ends of the pipes receive from the water; the liquid particles in contact with the plug of a cock, when it is turned to stop the discharge, being forcibly driven up against it by those constituting the moving mass behind.—The philosophical instrument named a *water hammer* illustrates this fact. The effect is much the same as if a solid rod moved with the same velocity as the water through the tube until its progress was stopped in the same manner, except that its momentum would be concentrated on that point of the pipe against which it struck, whereas with the liquid rod the momentum would be communicated equally to, and might be transmitted from *any* part of, the lower end of the tube; hence it often occurs that the ends of such pipes, when made of lead, are swelled greatly beyond their original dimensions. We have seen some ¾ of an inch bore, become enlarged to 1½ inches before they were ruptured. At a hospital in Bristol, England, a plumber was employed to convey water through a leaden pipe from a cistern in one of the upper stories to the kitchen below, and it happened that the lower end of the tube was burst nearly every time the cock was used. After several attempts to remedy the evil, it was determined to solder one end of a smaller pipe immediately behind the cock, and to carry the other end to as high a level as the water in the cistern; and now it was found that on shutting the cock the pipe did not burst as before, but a jet of considerable hight was forced from the upper end of this new pipe: it therefore became necessary to increase its hight to prevent water escaping from it—upon which it was continued to the top of the hospital, being twice the hight of the supplying cistern, but where, to the great surprise of those who constructed the work, some water still issued: a cistern was therefore placed to receive this water, which was found very convenient, since it was thus raised to the highest floors of the building without any extra labor. Here circumstances led the workmen to the construction of a water-ram without knowing that such a machine had been previously devised.

The first person who is known to have raised water by a ram, designed for the purpose was, Mr. Whitehurst, a watchmaker of Derby, in England. He erected a machine similar to the one represented by the next figure, in 1772. A description of it was forwarded by him to the Royal Society, and published in vol. lv. of their Transactions.



No. 167. Whitehurst's Water-Ram.

A represents the spring or reservoir, the surface of the water in which was of about the same level as the bottom of the cistern B. The main pipe from A to the cock at the end of C, was nearly six hundred feet in length, and one and a half inches bore. The cock was sixteen feet below A, and furnished water for the kitchen, offices, &c. When it was opened the liquid column in A C was put in motion, and acquired a velocity due to a fall of sixteen feet; and as soon as the cock was shut, the momentum of this long column opened the valve, upon which part of the water rushed into the air-vessel and up the vertical pipe into B. This effect took place every time the cock was used, and as water was drawn from it at short intervals for

household purposes, "from morning till night—all the days in the year," an abundance was raised into B, without any exertion or expense.

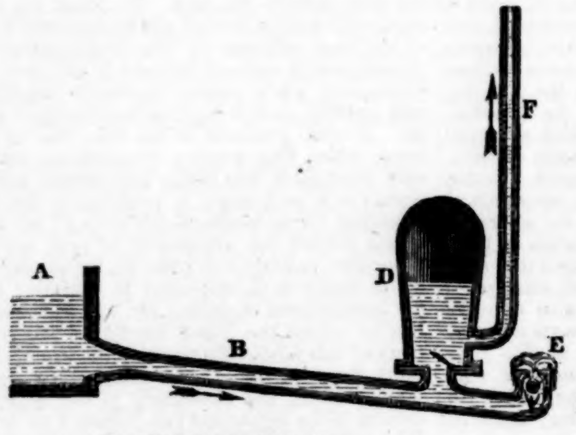
Such was the first water-ram. As an original device, it is highly honorable to the sagacity and ingenuity of its author; and the introduction of an air vessel, without which all apparatus of the kind could never be made durable, strengthens his claims upon our regard. In this machine he has shown that the mere act of drawing water from long tubes for ordinary purposes, may serve to raise a portion of their contents to a higher level; an object that does not appear to have been previously attempted, or even thought of. The device also exhibits another mode, besides that by pressure engines, of deriving motive force from liquids thus drawn, and consequently opens another way by which the immense power expended in raising water for supplying cities, may again be given out with the liquid from the lateral pipes. Notwithstanding the advantages derived from such an apparatus, under circumstances similar to those indicated by the figure, it does not appear to have elicited the attention of engineers, nor does Whitehurst himself seem to have been aware of its adaptation as a substitute for forcing pumps, in locations where the water drawn from the cock was not required, or could not be used. Had he pursued the subject, it is probable the idea of opening and closing the cock (by means of the water that escaped) with some such apparatus as that invented by Fludd, would have occurred to him, and then his machine being made self-acting, would have been applicable in a thousand locations. But these additions were not made, and the consequence was, that the invention was neglected, and but for the one next to be described, it would most likely have passed into oblivion, like the steam machines of Branca, Kircher, and Decaus, till called forth by the application of the same principle in more recent devices.

Whenever we peruse accounts of the labors of ingenious men, in search of new discoveries in science or the arts, sympathy leads us to rejoice at their success and to grieve at their failure: like the readers of a well written novel who enter into the views, feelings and hopes of the hero; realize his disappointments, partake of his pleasures, and become interested in his fate; hence something like regret comes over us, when an industrious experimenter, led by his researches to the verge of an important discovery, is, by some circumstance, diverted (perhaps temporarily) from it; and a more fortunate or more sagacious rival steps in and bears off the prize from his grasp—a prize, which a few steps more would have put him in possession of. Thus Whitehurst with the water-ram, like Papin with the steam engine, discontinued his researches at the most interesting point—at the very turning of the tide that would have carried him to the goal; and hence the fruit of both their labors has contributed but to enhance the glory of their successors.

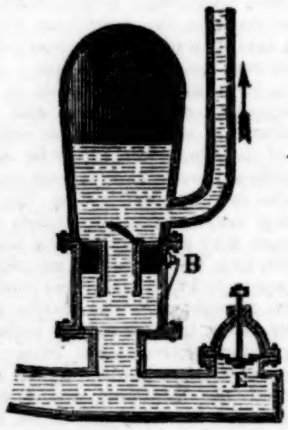
The *Bèlier hydraulique* of Montgolfier was invented in 1796. (Its author was a French paper maker, and the same gentleman who, in conjunction with his brother, invented balloons in 1782.) Although it is on the principle of Whitehurst's machine, its invention is believed to have been entirely independent of the latter. But if it were even admitted that Montgolfier was acquainted with what Whitehurst had done, still he has, by his improvements, made the ram entirely his own. He found it a comparatively useless device, and he rendered it one of the most efficient—it was neglected or forgotten, and he not only revived it, but gave it a permanent place among hydraulic machines, and actually made it the most interesting of them all. It was, previous to his time, but an embryo; when, like another Prometheus, he not only wrought it into shape and beauty, but imparted to it, as it were, a principle of life, that rendered its movements *self-acting;* for it requires neither the attendance of man, nor any thing else, to keep it in play, but the momentum of the water it is employed to elevate. Like the organization of animal life, and the mechanism by which the blood circulates, the pulsations of this admirable machine incessantly continue day and night, for months and years; while nothing but deficiency of the liquid, or defects in the apparatus can induce it to stop.—It is, compared to Whitehurst's, what the steam-engine of Watt is to that of Savary or Newcomen.

Montgolfier positively denied having borrowed the idea from any one—he claimed the invention as wholly his own, and there is no reason whatever to question his veracity. The same discoveries have often been, and still are, made in the same and in distant countries, independently of each other. It is a common occurrence, and from the constitution of the human mind will always be one. A patent was taken out in England for self-acting rams in 1797 by Mr. Boulton, the partner of Watt, and as no reference was made in the specification to Montgolfier, many persons imagined them to be of English origin, a circumstance that elicited some remarks from their author. "Cette invention (says Montgolfier) n'est point d'origine Anglaise, elle appartient toute entière à la France; je déclare que j'en suis le seul inventeur, et que l'idée ne m'en a été fournie par personne; il est vrai qu'un de mes amis a fait passer, avec mon agrément, a MM. Watt et Boulton, copie de plusieurs dessins que j'avais faits de cette machine, avec un mémoire détaillé sur ses applications. Ce sont *ces mémes dessins* qui ont été fidèlement copiés dans la patente prise par M. Boulton á Londres, en date du 13 Décembre 1797; ce qui est une vérité dont il est bien éloigné de disconvenier, ainsi que le respectable M. Watt." We have inserted this extract from Hachette, because we really supposed on reading the specification of Boulton's patent in the Repertory of Arts, (for 1798, vol. ix.) that the various modifications of the ram there described were the invention of that gentleman. The patent was granted to "Matthew Boulton, for *his* invention of improved apparatus and methods for raising water and other fluids."

No. 168 represents a simple form of Montgolfier's ram. The motive column descends from a spring or brook A through the pipe B, near the end of which an air chamber D, and rising main F, are attached to it as shown in the cut. At the extreme end of B, the orifice is opened and closed by a valve E, instead of the cock in No. 167. This valve opens downwards and may either be a spherical one as in No. 168, or a common spindle one as in No. 169. It is the play of this valve that renders the machine self-acting. To accomplish this, the valve is made of, or loaded with, such a weight as just to open when the water in B is at rest; *i. e.* it must be so heavy as to overcome the pressure against its under side when closed, as represented at



No. 168. Montgolfier's Ram.



No. 169. The same.

No. 169. Now suppose this valve open as in No. 168, the water flowing through B soon acquires an additional force that carries up the valve against its seat; then, as in shutting the cock of Whitehurst's machine, a portion of the water will enter and rise in F, the valve of the air chamber preventing its return. When this has taken place the water in B has been brought to rest, and as in that state its pressnre is insufficient to sustain the weight of the valve, E opens; (descends) the water in B is again put in motion, and again it closes E as before, when another portion is driven into the air vessel and pipe F; and thus the operation is continued, as long as the spring affords a sufficient supply and the apparatus remains in order.

The surface of the water in the spring or source should always be kept at the same elevation, so that its pressure against the valve E may always be uniform—otherwise the weight of E would have to be altered as the surface of the spring rose and fell.

This beautiful machine may be adapted to numerous locations in every country. When the perpendicular fall from the spring to the valve E is but a few feet, and the water is required to be raised to a considerable hight through F, then, the *length* of the ram or pipe B, must be increased, and to such an extent that the water in it is not forced back into the spring when E closes, which will always be the case if B is not of sufficient length. Mr. Millington, who erected several in England, justly observes that a very insignificant pressing column is capable of raising a very high ascending one, so that a sufficient fall of water may be obtained in almost every running brook, by damming the upper end to produce the reservoir, and carrying the pipe down the natural channel of the stream until a sufficient fall is obtained. In this way a ram has been made to raise one hundred hogsheads of water in twenty-four hours to a perpendicular hight of one hundred and thirty-four feet, by a fall of only four feet and a half.—M. Fischer of Schaffhausen, constructed a water-ram in the form of a beautiful antique altar, nearly in the style of that of Æsculapius, as represented in various engravings. A basin about six inches in depth, and from eighteen to twenty inches in diameter, received the water that formed the motive column. This water flowed through pipes three inches in diameter that descended in a spiral form into the base of the altar; on the valve opening a third of the water escaped, and the rest was forced up to a castle several hundred feet above the level of the Rhine.

A long tube laid along the edge of a rapid river, as the Niagara above the falls, or the Mississippi, might thus be used instead of pumps, water wheels, steam-engines and horses, to raise the water over the highest banks and supply inland towns, however elevated their location might be; and there is scarcely a farmer in the land but who might, in the absence of other sources, furnish his dwelling and barns with water in the same way, from a brook, creek, rivulet or pond.

If a ram of large dimensions, and made like No. 168, be used to raise water to a great elevation, it would be subject to an inconvenience that would soon destroy the beneficial effect of the air chamber. When speaking of the air vessels of fire-engines, in the third book, we observed that if air be subjected to great pressure in contact with water, it in time becomes incorporated with or absorbed by the latter.—As might be supposed, the same thing occurs in water-rams; as these when used are incessantly at work both day and night. To remedy this, Montgolfier ingeniously adapted a very small valve (opening inwards) to the pipe beneath the air chamber, and which was opened and shut by the ordinary action of the machine. Thus, when the flow of the water through B is suddenly stopped by the valve E, a partial vacuum is produced immediately below the air chamber by the recoil of the water, at which instant the small valve opens and a portion of air enters and supplies that which the water absorbs. Sometimes this *snifting* valve, as it has been named, is adapted to another chamber immediately below that which forms the reservoir of air, as at B in No. 169. In small rams a sufficient supply is found to enter at the valve E.

Although air chambers or vessels are not, strictly speaking, constituent elements of water-rams, they are indispensable to the permanent operation of these machines. Without them, the pipes would soon be ruptured by the violent concussion consequent on the sudden stoppage of the efflux of the motive column. They perform a similar part to that of the bags of wool, &c. which the ancients, when besieged, interposed between their walls and the battering rams of the besiegers, in order to break the force of the blows.

THE SCREW.

[From Dr. Dion. Lardner's Lectures, now in course of publication, by Greeley & McElrath.]

In the applisation of the screw, the weight or resistance is not, as in the inclined plane and wedge, placed upon the surface of the plane or thread. The power is usually transmitted by causing the screw to move in a concave cylinder, on the interior surface of which a spiral cavity is cut, corresponding exactly to the thread of the screw, and in which the thread will move by turning round the screw continually in the same direction. This hollow cylinder is usually called the *nut* or *concave screw*. The screw surrounded by its spiral thread is represented in fig. 8; and a section of the same playing in the nut is represented in fig. 9.

Fig. 8.

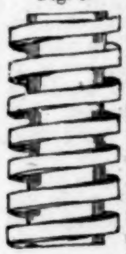
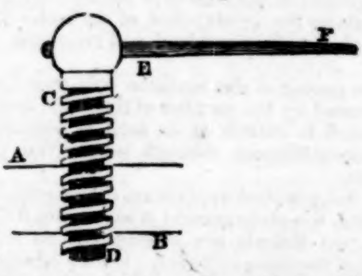


Fig. 9.



There are several ways in which the effect of the power may be conveyed to the resistance by this apparatus.

First, let us suppose that the nut A B is fixed. If the screw be continually turned on its axis, by a lever E F inserted in one end of it, it will be moved in the direction C D, advancing every revolution through a space equal to the distance between two contiguous threads. By turning the lever in an opposite direction, the screw will be moved in the direction D C.

If the screw be fixed, so as to be incapable either of moving longitudinally or revolving on its axis, the nut A B may be turned upon the screw by a lever, and will move on the screw toward C or toward D, according to the direction in which the lever is turned.

In the former case, we have supposed the nut to be absolutely immovable; and, in the latter case, the screw to be absolutely immovable. It may happen, however, that the nut, though capable of revolving, is incapable of moving longitudinally; and that the screw, though incapable of revolving, is capable of moving longitudinally. In that case, by turning the nut A B upon the screw by the lever, the screw will be urged in the direction C D or D C, according to the way in which the nut is turned.

The apparatus may, on the contrary, be so arranged that the nut, though incapable of revolving, is capable of moving longitudinally; and the screw, though capable of revolving, is incapable of moving longitudinally. In this case, by turning the screw in the one direction, or in the other, the nut A B will be urged in the direction C D or D C.

All these various arrangements may be observed in different applications to the machine.

A screw may be cut upon a cylinder by placing the cylinder in a turning-lathe, and giving it a rotatory motion upon its axis. The cutting point is then presented to the cylinder, and moved in the direction of its length, at such a rate as to be carried through the distance between the intended thread, while the cylinder revolves once. The relative motions of the cutting point and the cylinder being preserved, with perfect uniformity, the thread will be cut from one end to the other. The shape of the threads may be either square, as in fig. 8, or triangular, as in fig. 10.

The screw is generally used in cases where severe pressure is to be excited through small spaces; it is, therefore, the agent in most presses. In fig. 11, the nut is fixed, and by turning the lever, which passes through the head of the screw, a pressure is excited upon any substance placed upon the plate immediately under the end of the screw.—In fig. 12, the screw is incapable of revolving, but is capable of advancing in the direction of its length. On the other hand, the nut is capable of revolving, but does not advance in the direction of the screw.—When the nut is turned by means of the screw inserted in it, the screw advances in the direction of its length, and urges the board which is attached to it upward, so as to press any substance placed between it and the fixed board above.

Fig. 10.

Fig. 11.

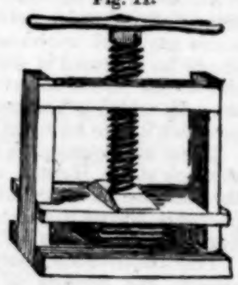
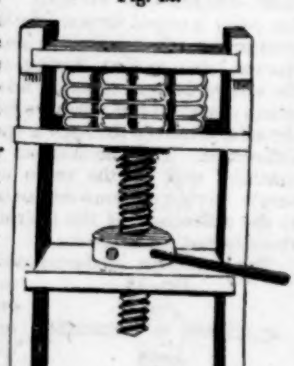


Fig. 12.



In cases where liquids or juices are to be expressed from solid bodies, the screw is the agent generally employed. It is also used in coining, where the impression of a die is to be made upon a piece of metal, and in the same way in producing the impression of a seal upon wax or other substance adapted to receive it. When soft and light materials, such as cotton, are to

be reduced to a convenient bulk for transportation, the screw is used to compress them, and they are thus reduced into hard, dense masses. In printing, formerly, the paper was urged by a severe and sudden pressure upon the types by means of a screw.

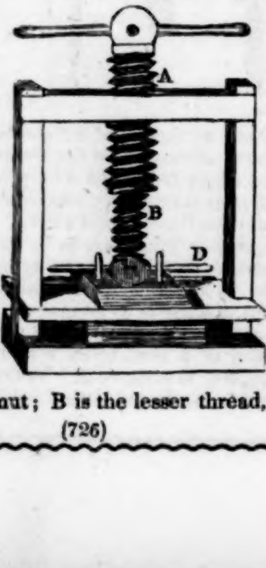
As the mechanical power of the screw depends upon the relative magnitude of the circumference through which the power revolves, and the distance between the threads, it is evident, that to increase the efficacy of the machine, we must either increase the length of the lever by which the power acts, or diminish the magnitude of the thread. Although there is no limit in theory to the increase of the mechanical efficacy by these means, yet practical inconvenience arises which effectually prevents that increase being carried beyond a certain extent. If the lever by which the power acts be increased, the same difficulty arises as was already explained in the wheel and axle: the space through which the power should act would be so unwieldy, that its application would become impracticable. If, on the other hand, the power of the machine be increased by diminishing the size of the thread, the strength of the thread will be so diminished, that a slight resistance will tear it from the cylinder. The cases in which it is necessary to increase the power of the machine being those in which the greatest resistances are to be overcome, the object will evidently be defeated if the means chosen to increase that power deprive the machine of the strength which is necessary to sustain the force to which it is to be submitted.

These inconveniences are removed by a contrivance of Mr. Hunter, which, while it gives to the machine all the requisite strength and compactness, allows it to have an almost unlimited degree of mechanical efficacy.

This contrivance consists in the use of two screws, the threads of which may have any strength and magnitude, but which have a very small difference of breadth. While the working point is urged forward by that which has the greater thread, it is drawn back by that which has the less; so that, during each revolution of the screw, instead of being advanced through a space equal to the magnitude of either of the threads, it moves through a space equal to their difference. The mechanical power of such a machine will be the same as that of a single screw, having a thread whose magnitude is equal to the difference of the magnitudes of the two threads just mentioned.

Thus, without inconveniently increasing the sweep of the power, on the one hand, or on the other, diminishing the thread until the necessary strength is lost, the machine will acquire an efficacy limited by nothing but the smallness of the difference between the two threads.

Fig. 13.



This principle was first applied in the manner represented in fig. 13. A is the greater thread, playing in the fixed nut; B is the lesser thread, cut upon a smaller cylinder, and playing in a concave screw, cut within the greater cylinder. During every revolution of the screw, the cylinder A descends through a space equal to the distance between its threads. At the same time, the smaller cylinder B ascends through a space equal to the distance between the threads cut upon it: the effect is, that the board D descends through a space equal to the difference between the threads upon A and the threads upon B, and the machine has a power proportionate to the smallness of this difference.

Thus, suppose the screw A has twenty threads in an inch, while the screw B has twenty-one: during one revolution, the screw A will descend through a space equal to the twentieth part of an inch. If, during this motion, the screw B did not turn within A, the board D would be advanced through the twentieth of an inch; but because the hollow screw within A turns upon B, the screw B will, relatively to A, be raised in one revolution through a space equal to the twenty-first part of an inch. Thus, while the board D is depressed through the twentieth of an inch by the screw A, it is raised through the twenty-first of an inch by the screw B. It is, therefore, on the whole, depressed through a space equal to the excess of the twentieth of an inch above the twenty-first of an inch—that is, through the four hundred and twentieth of an inch.

The power of this machine will, therefore, be expressed by the number of times the four hundred and twentieth of an inch is contained in the circumference through which the power moves.

In the practical application of this principle at present, the arrangement is somewhat different, The two threads are usually cut on different parts of the same cylinder. If nuts be supposed to be placed upon these, which are capable of moving in the direction of the length, but not of revolving, it is evident that by turning the screw once round, each nut will be advanced through a space equal to the breadth of the respective threads. By this means the two nuts will either approach each other, or mutually recede, according to the direction in which the screw is turned, through a space equal to the difference of the breadth of the threads, and they will exert a force either in compressing or extending any substance placed between them, proportionate to the smallness of that difference.

A toothed wheel is sometimes used instead of a nut, so that the same quality by which the revolution of the screw urges the nut forward is applied to make the wheel revolve. The screw is in this case called an endless screw, because its action upon the wheel may be continued without limit. This application of the screw is represented in fig. 14. P is the winch to which the power is applied; and its effect at the circumference of the wheel is estimated in the same manner as the effect of the screw upon the nut.—This effect is to be considered as a power acting upon the circumference of the wheel; and its proportion to the weight or resistance is to be calculated in the

Fig. 14.

same manner as the proportion of the power to the weight in the wheel and axle.

We have hitherto considered the screw as an engine used to overcome great resistances. It is also eminently useful in several departments of experimental science, for the measurement of very minute motions and spaces, the magnitude of which could scarcely be ascertained by any other means. The very slow motion which may be imparted to the end of a screw, by a very considerable motion in the power, renders it peculiarly well adapted for this purpose. To explain the manner in which it is applied—suppose a screw to be so cut as to have fifty threads in an inch, each revolution of the screw will advance its point through the fiftieth part of an inch. Now, suppose the head of the screw to be a circle, whose diameter is an inch, the circumference of the head will be something more than three inches; this may be easily divided into a hundred equal parts distinctly visible. If a fixed index be presented to this graduated circumference, the hundredth part of a revolution of the screw may be observed, by noting the passage of one division of the head under the index. Since one entire revolution of the head moves the point through the fiftieth of an inch, one division will correspond to the five thousandth of an inch. In order to observe the motion of the point of the screw in this case, a fine wire is attached to it, which is carried across the field of view of a powerful microscope, by which the motion is so magnified as to be distinctly perceptible.

A screw used for such purposes is called a *micrometer screw*. Such an apparatus is usually attached to the limbs of graduated instruments, for the purpose of astronomical and other observation. Without the aid of this apparatus, no observation could be taken with greater accuracy than the amount of the smallest division upon the limb. Thus, if an instrument for measuring angles were divided into small arches of one minute, and an angle were observed which brought the index of the instrument to some point between two divisions, we could only conclude that the observed angle must consist of a certain number of degrees and minutes, together with an additional number of seconds, which would be unknown, inasmuch as there would be no means of ascertaining the fraction of a minute between the index and the adjacent division of the instrument. But if a screw be provided, the point of which moves through a space equal to one division of the instrument, with sixty revolutions of the head, and the head itself be divided into one hundred equal parts, each complete revolution of the screw will correspond to the sixtieth part of a minute, or to one second, and each division on the head of the screw will correspond to the hundredth part of a second. The index being attached to this screw, let the head be turned until the index be moved from its observed position to the adjacent division of the limb. The number of complete revolutions of the screw necessary to accomplish this will be the number of seconds; and the number of parts of a revolution over the complete number of revolutions will be the hundredth parts of a second necessary to be added to the degrees and minutes primarily observed.

It is not, however, only to angular instruments that the micrometer screw is applicable; any spaces whatever may be measured by it. An instance of its mechanical application may be mentioned in a steel-yard, an instrument for ascertaining the amount of weights by a given weight, sliding on a long graduated arm of a lever. The distance from the fulcrum, at which this weight counterpoises the weight to be ascertained, serves as a measure to the amount of that weight. When the sliding weight happens to be placed between two divisions of the arm, a micrometer screw is used to ascertain the fraction of the division.

Hunter's screw, already described, seems to be well adapted to micrometical purposes; since the motion of the point may be rendered indefinitely slow, without requiring an exquisitely fine thread, such as, in the single screw, would in this case be necessary.

COMPARATIVE VALUE OF DIFFERENT KINDS OF FODDER.—The following table is the result of experiments made by the principal agriculturists of the continent, and published by M. Antoine at Nancy. The best upland meadow hay is taken as the standard, at 100 lbs.; and the specified weight of the other kinds of fodder enumerated are required to produce the same results:

Good hay	lbs. 100
Aftermath hay	102
Clover hay, made when the blossom is completely developed	90
Ditto, before the blossom expands	88
Clover, second crop	98
Lucerne hay	98
Sainfoin hay	89
Tare hay	91
Spergula arvensis, dried	90
Clover hay, after the seed	146
Green Indian corn	275
Vetches or tares, green	410
Green clover	457
Green spergula	425
Stems and leaves of Jerusalem artichokes	325
Cow-cabbage leaves	541
Beet-root leaves	600
Potato haulm	300
Rye straw	442
Oat straw	196
Peas haulm	153
Vetch haulm	159
Bean haulm	140
Buckwheat straw	195
Dried stalks of Jerusalem artichokes	170
Dried stalks of Indian corn	400
Millet straw	250
Raw potatoes	201
Boiled ditto	175
White Silesian beet	220
Mangel-wurzel	339
Turnips	504
Carrots	276
Swedish Turnips	308
Ditto, with leaves on	350
Grain—Rye	54
Wheat	42
Barley	54
Oats	59
Vetches	50
Peas	45
Beans	45
Buckwheat	64
Indian corn	57
Linseed cake	69
Wheat bran	105
Rye bran	109
Wheat, peas and oat chaff	167
Rye and barley chaff	179

EXPERIMENTS WITH MANURES.

BY ROBERT MONTEITH, ESQ. OF CARSTAIRS.

1. OAT CROP, 1843.—Part of a field manured with 267 lbs. of guano, at the cost of 31s. per imperial acre, produced per acre......59 bushels.

Manured with 10 bushels bone-dust, at the cost of 23s. 4d. per imperial acre, produced per acre........43 do.

The difference may be stated as follows:

Cost of guano 31s. produce 59 bush. at 2s. 6d. £7 7 6
Cost of bones 23s. 4d. do. 43 do. do. 5 7 6

7s. 8d. £2 0 0
Deduct difference of manure......... 0 7 8

Leaving in favor of Guano £1 12 4

2. HAY CROP, 1843.—To part of a field, manured the previous year with farm-yard dung, was given 267 lbs. of guano per imperial acre, at the cost of 31s. and the *extra produce*, per acre, was 22 cwt. of hay, which, at 3s. per cwt. is £3 6 0

Deduct expense of guano 1 11 0

Leaving in favor of guano £1 15 0 per acre.

3. WITH TURNIP, 1843.

No.	Quantity of land tried	Description of manure tried, and quantity per imperial acre.		Cost of Dung pr acre			Cost of other Manures per acre.			Total cost per acre.			Produce per imperial acre stored Nov. 15, 1843.	
	Acre.	*Yds.*		£	s.	d.	£	s.	d.	£	s.	d.	*Tons.*	*Cwt.*
1	¼		Guano 4 cwt......................				2	8	0	2	8	0	11	8
2	¼	Dung 28	Sulphate of Soda, 1 cwt..................	5	12	0	0	4	0	5	16	0	9	8
3	¼	" 28	Burned Bones, 6 cwt.................	5	12	0	2	2	0	7	14	0	7	11
4	¼	" 28	Bone-dust, 20 bushels.................	5	12	0	2	6	8	7	18	8	7	2
5	¼	" 28		5	12	0				5	12	0	4	19
6	¼	" 28	Gypsum, 2½ cwt....................	5	12	0	0	8	9	6	0	9	6	1
7	¼	" 28	Guano, 4 cwt.	5	12	0	2	8	0	8	0	0	7	13
8	1-16	" 28	Beech-ashes, 48 bushels	5	12	0	0	12	0	6	4	0	5	12
9	1-16		Gypsum, 6 cwt......................				1	1	0	1	1	0	a failure.	
10	1		Bone-dust, 25 bushels				4	3	4	4	3	4	9	6
11	1		Do. 12 bushels, and 133 lbs. guano				2	14	3	2	14	3	11	15
12	1		Guano, 356 lbs........................				1	18	2	1	18	2	11	0
13	1		Guano, 267 lbs........................				1	8	7	1	8	7	10	15

November 30, 1843.—The turnip crop on the field in which the above experiments were tried was fully one-third deficient in quantity from crops generally grown on such land in this part of the country, the soil being heavy and under medium quality, All the turnip crops in this neighborhood are, however, from one-third to one-half deficient this season.

EXPENSE OF KEEPING HORSES.—In a late English Monthly Magazine, there is an elaborate essay on the winter and summer keeping of Farm Horses. Though the whole of it is interesting to read, the articles of food, brought into the comparison, are so different from those in use in our country, that it would not do to give up the space that the whole essay would occupy. But look here at the conclusion to which the writer arrives:

Thus, then, it is seen that the cost of keeping each horse upon a farm of 120 imperial acres of heavy land, all under crop, is about £8 9s. 5d. during the five summer months, and £12 12s. 2¼d. for the seven winter months, or in all £21 11s. 7¼d. being a saving of £2 2s. 2¼d. in favor of bean straw and boiled mashes as compared to hay and hard corn, for the winter; and a saving of £2 8s. 9d. in the case of posting horses for a period of six months; or a clear gain of £18 9s. 8¼d. to the farmer on the winter keeping of nine horses, and of £131 12s. 6d. to the postmaster on fifty-four horses during the winter—no small matter in these times, taken in connection with the positively improved condition of both classes of horses, and the regular performance of ordinary work in both cases. Otherwise the comparative saving would be of little avail, were the horses not at the same time found equal, and more than equal, to their ordinary work; for *no greater error can be committed by any farmer than to allow his horses to fall off for want of nutritious provender, especially in winter, with the prospect of long days of severe spring labor before them.*

COMPARATIVE VIEWS OF THE PROGRESS OF POPULATION IN CERTAIN REGIONS OF THE UNITED STATES:

WITH REMARKS....BY WILLIAM DARBY.

WASHINGTON, 10th Nov. 1845.

JOHN S. SKINNER, Esq.

Dear Sir—The monthly reception of your "LIBRARY" affords me the double pleasure of hearing from you by your valuable labors, and of finding by their means that Agriculture is becoming, in our country, a science. I rejoice still more to see elements collected which, when published in so attractive a form as the Library, must have great effect on the far too prevalent emigration from the Atlantic region of the United States into the interior and Western sections of North America.

You cannot, as you know my sentiments on the subject, but many others may suppose, from my frequent essays on the rapid increase and dispersion of our population over the continent, that I was an advocate for that course of things. In those essays I have spread before the public data on what neither myself or any one else can control—stated facts as they presented themselves, as inevitable consequences.

In advance of the matter enclosed, let me observe that I principally value such works as the "LIBRARY" from their tendency to demonstrate false views, which lead so many to sacrifice advantages already within their reach, for speculative hopes, distant in space and time—hopes never, by any possibility, realized, except in very rare instances.

Few persons are aware of the peculiar advantages of the Atlantic slope of North America. If we extend our views into a not very distant futurity, when the central part of the Continent will teem with inhabitants, the Atlantic border will stand as the gateway between the great civilized nations of the Eastern and Western Continents. In some very essential respects, such is the case at present.

As population is the first, the last, and principal consideration on all statistical subjects, I have constructed the enclosed tabular, to serve as comparative data, as regards those parts of the Atlantic border where the facilities of commercial and agricultural, as well as manufacturing prosperity abound, and yet have remained stationary, or retrograde, whilst other parts, in no essential respect differing in natural advantages, have advanced in wealth and power.

It must be obvious that in these views I can have no sectional or other partial bias. My desire is to show, from actual experience, that there must exist either some inherent cause of discontent, or most alluring prospects of gain, to induce the people of the Atlantic border to abandon their place of birth, and cut asunder so many ties, so many domestic associations—and that to an extent not only to prevent increase, but to produce a diminution, of physical, intellectual, and moral power. Were we made acquainted with such a fact, founded on official data, in the political history of any monarchical State of Europe, we would at once set it down as a proof of the deteriorating effects of that form of government.

In the case for our consideration, now before us, and applied to a region most favored by every facility to derive benefit from human labor, where Nature itself has scooped many of the finest havens of the globe—havens on which cities have already risen, in a comparatively short period, vying with the great marts of Europe and Asia; such a country, also abounding in means of religious, moral and intellectual culture; what are the inducements offered by western or central settlements, to compensate for the sacrifice of so many advantages, already at command, on the Atlantic border? Land! more land! Does any one suppose that the expense of removal and obtaining new residences will not be as great, and the success more precarious as to resulting profit, than the same time, means, and labor, applied to the improvement of soil already possessed?

On such a subject, yourself and readers will pardon the introduction of a moment's allusion to my own experience, and also the confident tone of my remarks. I was removed into the interior when very young, but old enough to remember much consequent hardship felt and witnessed. It is true that many of the difficulties to which emigrants of more than half a century past were exposed are now removed or greatly mitigated; yet I have no hesitation to

say that, as a rule admitting very few exceptions, the first generation of emigrants are worn away with labor and care, and with no small share of regret, before the second can be placed in as happy homes as were left for shadowy hopes. Were the Atlantic border of the United States, like the Pacific border of China, teeming with an overcharged population, relief would be naturally and rationally sought, by removal to a wilderness, or thinly peopled region, with a productive soil and temperate climate, did such offer; but, from spaces where the maximum of distributive population falls far short of fifty to the square mile, and where two hundred on equal surface could find support, with the enjoyment of every comfort of life, there must exist some great defect in modes of thinking to superinduce extensive emigration.

In the selection of element for the following comparative tables, I have not included either Maine or New-York, as causes peculiar to both these States have influenced their political history. The sections adopted have been comparatively less influenced by external causes than most other parts of the United States, and, as to soil, have in themselves much in common.—They have all, in a peculiar degree, the advantages of commercial facilities, but those southward of New-York in a much greater extent than those to the northward. The period chosen of thirty years, from 1810 to 1840, was, perhaps, of any portion of time since the English Colonies were originally formed in North America, the one best calculated to illustrate the philosophy of our statistical history.

TABLE I. *Table of the Progressive Population of the Five States named, from* 1810 *to* 1840, *as deduced from the respective Census Returns of those years.*

STATES.	Population, 1810.	Population, 1840.	Area in sqr. miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Vermont....................	217,713	291,948	10,212	28	1·34
New-Hampshire............	214,360	284,574	9,280	30	1·33
Massachusetts..............	472,040	737,699	7,800	94	1·56
Connecticut................	262,042	309,978	4,674	66	1·18
Rhode Island..............	77,031	108,830	1,360	80	1·4
Amount............	1,243,216	1,733,029	33,326	52	1·31

TABLE II. *Table of the Progressive Population of the Lower or Maritime Counties of New-Jersey, Pennsylvania, Maryland, and the whole three Counties of Delaware, from* 1810 *to* 1840.

COUNTIES.		Population, 1810.	Population, 1840.	Area in sq. miles	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
NEW-JERSEY..	Cape May.....	3,632	5,344	310	17	1·47
	Cumberland...	12,640	14,374	450	32	1·13
	Salem.........	12,761	16,024	300	53	1·25
PENNSYLVANIA	Chester	39,596	57,513	732	54	1·45
	Delaware	14,734	19,791	220	nearly 90	1·34
DELAWARE ...	Newcastle.....	24,429	33,120	456	72	1·35
	Kent...........	20,495	19,872	640	30	3 per cent.
	Sussex.........	28,540	25,093	875	28	11 do.
MARYLAND ...	Caroline.......	9,453	7,806	240	32	17½ do.
	Cecil...........	13,066	17,232	264	65	1·31
	Dorchester	18,108	18,843	640	29	1·04
	Kent...........	11,450	10,842	240	77	10 per cent.
	Queen Ann ...	16,648	12,633	400	31	24 do.
	Somerset......	17,579	19,508	540	36	1·11
	Talbot	14,157	12,090	200	60	15 per cent.
	Worcester	16,971	18,377	700	26	1·08
	Amount...	274,299	308,442	8,207	37	1·124

With similar views which induced me to construct the foregoing tables, I drew up a rough table of that part of Virginia east of the Blue Ridge, and intended to copy it for your use; but, finding it divided into sixty-five counties, some of which had been, from 1810 to 1840, divided, I considered it more satisfactory to present the whole in one point of view. That part of Virginia has a rather remarkable approach to a triangle, having two hundred and sixty miles along the Blue Ridge—a very near equal distance on North-Carolina—and, in direct distance, about two hundred and twenty from the south-eastern angle on the Atlantic Ocean to the northern at the mouth of the Shenandoah: area about 27,000 square miles.

On this space, in 1810, by the census returns o, that year, there existed a population of 705,196; which mass had, in the ensuing thirty years, augmented to 800,036, or increased by slow ratio of 1·134. Many of the counties remained nearly stationary, while some, similar to several in Table II., had diminished in population.

TABLE III. *Summary of Tables I. and II.*

Tables.	Population, 1810.	Population, 1840.	Area in square miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Table I.	1,243,216	1,733,029	33,326	52	1·39
Table II.	274,299	308,442	8,207	37	1·124
Amount	1,517,515	2,041,471	41,523	49	1·345

TABLE IV. *Elements of Table II. combined with those of Eastern Virginia.*

	Population, 1810.	Population, 1840.	Area in square miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Table II.	274,299	308,442	8,207	37	1·124
Eastern Virginia	705,196	800,036	27,000	33 7-10	1·134
Amount	979,495	1,108,478	35,207	31 4-10	1·131

The two right-hand columns of these tables afford lessons which ought to excite serious reflections on our domestic policy. To stay the current of Western emigration is a hopeless prospect, but many may be restrained from casting themselves on the current by timely warning. Let any person open a map of the United States, and scan the surface embraced by all the tabular views here presented, and then, with an Atlas of the World before him, find, if he can, a single other space on Earth, all things considered, superior. I have not, for obvious reasons, included lower New-York and the more populous maritime counties of New-Jersey; but may observe that no other principle in statistics is more sure in application than that great cities contribute to make great counties around them. That districts in their vicinity should not only remain, as to population, stationary, but some of them have a diminishing ratio, while were rising such cities as New-York, Philadelphia, Wilmington and Baltimore, must arise from some sinister cause. Let us pause a moment, and examine the general progress of the entire population of the United States, during the Thirty Years' Period, from 1810 to 1840.

TABLE V. *Tabular View of the Progressive Population of the whole States and Territories of the United States, which were embraced by both enumerations.*

STATES.	Population, 1810.	Population, 1840.	Area in sqr. miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Maine	228,705	501,793	33,000	15·2	2·19
New-Hampshire	214,360	284,574	9,280	30	1·33
Vermont	217,713	291,948	10,212	28	1·34
Massachusetts	472,040	737,699	7,800	94	1·56
Rhode Island	77,031	108,830	1,360	80	1·40
Connecticut	262,042	309,878	4,674	66	1·18
New-York	959,949	2,428,921	46,000	52·7	2·53
New-Jersey	249,555	373,303	6,900	54	1·49
Pennsylvania	810,091	1,724,033	43,950	41·4	2·12
Delaware	72,674	78,085	2,068	37·7	1·07 4-10
Maryland	380,546	470,019	10,800	43	1·23
Virginia	974,642	1,239,797	64,000	19·3	1·23
North-Carolina	555,500	753,419	43,800	17·2	1·35
South-Carolina	415,115	594,398	30,000	19·8	1·37
Georgia	252,433	691,392	58,200	12	2·34
Alabama	20,845	590,756	50,000	11·8	2·74
Mississippi	40,352	375,651	45,350	8·2	9·30
Louisiana	76,556	352,411	48,220	7·5	4·60
Tennessee	261,727	829,210	40,000	20	3·13
Kentucky	406,511	779,828	39,000	20	1·90
Ohio	230,760	1,519,467	39,000	40	6·58
Michigan	4,762	212,267	54,000	40	44·6
Indiana	24,520	685,866	36,250	19	27·9
Illinois	12,282	476,183	59,000	8	38·9
Missouri	20,845	383,702	60,300	19	18·4
Columbia	24,023	43,712	100		1·81
Amount	7,239,814	16,837,285	827,264	20½	2·32

The figures in Table V. speak, in strong language, the peculiar diffusion of population—the immense void to fill up in the already organized States—and the highly important fact that while, in 1840, several of the central States nearly doubled the mean population of the Union, as many of the old Atlantic States fell short of the mean of the whole.

In such estimates, we may premise that positive accuracy cannot be attained, and ought not to be expected. It is, however, of very minor consequence that minute details do not present mathematical precision, while the general results cannot be disputed. If no change takes place in the current of emigration, the centre of political power must correspond with the centre of force, and leave at long distance the Atlantic coast.

ON THE IMPORTANCE OF DRAINING LAND.

We remember well the time when the idea of fertility and heavy products was so intimately and thoroughly blended with that of *moisture*, that wherever we saw a piece of land that was constantly *moist*, so that no water laid on its surface, we set down *that spot* as one that would not fail to bring a heavy crop—especially of grass; and we have our doubts whether there was not a time when this was the common impression. Inquiry, reflection and experience are, however, now doing for Agriculture what they have sooner done for other pursuits; and now, fortunately, the *mind is brought to work at every turn*, and empiricism and prejudice are made to give way before investigation and proof. Now the Farmer is taught by the exercise of his reason, and, even without knowing it, by the principles of agricultural chemistry, that a *settled, abiding moisture* in land, resulting from some obstruction to the escape of water, either rain or spring water, is incompatible with that degree of *warmth* which is one of the indispensable conditions to the development and growth of vegetables. Hence, as the Farmer who walks or rides over his estate, and sees a sunken or a low spôt, which in the driest weather shows signs of *constant* dampness, indicated by coarse aquatic grasses, or otherwise, he says to himself, 'There is a portion of my capital lying dead and inert. I must therefore contrive so to *drain it* that the water will not *settle* upon or in it, and thus give it life and activity. Then I shall have removed the only obstacle which prevents it from yielding a heavier crop either of *grain* or grass, than any other equal portion of my estate;'—for the Farmer ought to lay it down as a rule, that even where he proposes to lay down his land in grass, it should yet be so well drained as to be well adapted to the growth of *grain*. Land so laid dry, will always give, with equal richness, a better crop of cleaner and more valuable *hay*, than that which is too wet to produce grain. Let him who wants to see heavy crops of clean, nutritious timothy hay, go to the naturally dry, hilly lands, such as George Patterson's, Gov. Howard's, or N. Bosley's, on the Gunpowder, in Maryland. True, there are many fields that are well adapted to the growth, and produce *heavy crops*, of tobacco or grain, that would not yield, and at all events not more than one crop, of timothy, or herd's grass, as it is called in different parts of the country; but that is owing, not to the absence of moisture, but to some other condition of the land—to too much of one and too little of another kind of soil, and to other circumstances, not to the want of moisture. Moisture, it is undeniable, is essential to the growth of all vegetables, according to the laws of vegetable physiology, but not fixed, pent-up moisture. Its departure, like its coming, should be free and natural. If we appear to dwell too much on this subject (of draining), it is because it is impossible to pass along through the country without being struck with the quantity of land, on almost every estate, the very best land on it, which is made sick and unproductive of all wholesome growths, by circumstances that *prevent the escape of redundant moisture*; and it is among the foremost of our wishes, to see the minds of land-holders possessed of the conviction that it is idle to be sighing and scheming for more land, or repining at the inadequacy of their income, while they have already so many acres that lie waste and unproductive—paying interest but yielding no dividend, for want of draining, grubbing, cleaning and manuring.

At a late meeting of the Scotch Highland Society, at Dumfries, an interesting discussion took place on Draining as "among the foremost" of the means for agricultural improvement. The particular testimony to which we would invite the attention of the reader is that of Mr. Elliot:

Prof. Johnston said—I am quite sure that the general statements which Mr. Elliot has made must have produced an impression upon the meeting. At the same time I know the farmers so well, that I am sure nothing will so much satisfy them, or the landlords either, as showing that the proposed improvement will put money in their pockets (hear, hear). Now Mr. Elliot has drained largely, and I know successfully (applause): you will excuse me, therefore, if I ask what are the results of his own draining? He is one of the most enterprising drainers in Dumfriesshire, and is, therefore, a noble example. I should like him to let the strangers here know what are the results during the eight years which he has been employed in draining? I would ask first, what have been the general results of draining on the whole farm?—how much has it increased the produce?

Mr. Elliot said—I have a statement which shows the improvement. Before, my land was partly wet and partly dry; one-half, nearly, has not been drained; but the principal improvement on the whole has been by draining. The result I will read to you:

PRODUCE OF THE OAT CROP ON THE FARM.

1st year, 1837	4·4	after one sown.
2d " 1838	5·6	"
3d " 1839	6·5	"
4th " 1840	6·8	"
5th " 1841	8·4	"
6th " 1842	7·6	"
7th " 1843	8·5	"
8th " 1844	8 3	"

BARLEY CROP.

1st year	8·2	after one sown; a small quantity this year sown on a piece of the best land.
2d "	5·4	after one.
3d "	6·2	"
4th "	10·2	"
5th "	10·1	"
6th "	11·7	"
7th "	10·5	"
8th "	11·8	"

Thus showing that I realized by draining an increase of more than double the original produce (Applause).

Professor Johnston.—It appears from Mr. Elliot's statement that he has doubled the produce of oats and barley in eight years. Now I know he can give us farther information. The second question I would ask is this: he has stated that if the whole farm was drained, it would have produced a greater increase. Now, can Mr. Elliot give us the detailed result of one part of the farm—what it was worth when he began, and what it is worth now?

Mr. Elliot.—One moor I drained which every one who knew it declared to be perfectly useless. It was not worth 2s. an acre. There were ninety-one acres of it; and one gentleman present who observed it told me that it never could be improved. I drained it, however, at an expense of nearly £600. A great part of it was covered with water-lilies, rushes, whins, heather, and gall-roots; but the first year, after liming and fallowing, it yielded 3,500 bushels, nearly 40 bushels to the acre (*Applause*). The second crop was equal. This year I have a crop of oats, after turnips, upon 12 acres of it, yielding 46 bushels to the acre; of potatoes I had a heavy crop, and of turnips also a good one (*Applause*). Another moor of 43 acres I drained at an expense of nearly £300. The first crop, after fallowing and lime, gave 42 bushels an acre. This was upon land that was previously not worth 2s. an acre (*Loud applause.*)

In answer to a question from the Chairman, Mr. Elliot said his land was situated at an elevation of about two hundred feet above the level of the sea.

Professor Johnston explained, in answer to a question sent in to him, that four and three-tenths and so on, occurring in Mr. Elliot's speech, meant that one seed gave four and three-tenths—that where he had only four once, he now got eight seeds off the same land.

By the bye, does it occur to the farmer, that when by *draining*, he doubles the produce of an acre, he doubles the value of his land? that it is far better than getting an additional acre of the same value—because, it takes only *half the labor* to cultivate one acre that it does to cultivate two, and yet he arrives at the same result as to the quantity of produce—in other words, reaps an equal reward, at half the expense? An acre of naturally fertile land rendered unproductive by superfluous moisture, and the crop of which is doubled by draining, is more profitable than an acre the produce of which is doubled by manuring—because, although the process of draining in the first instance, may be more expensive than that of manuring an acre of poor dry land, yet the manured land will be much sooner exhausted and reduced again to unproductiveness, than that sort of land which usually requires draining. Besides, it is absolutely disreputable for a farmer to have on his estate at every turn, these valuable spots—sometimes one acre—sometimes more, sometimes less—which ask only to be drained to give him the most valuable return for his labor; but which in the condition they are left, throw up worthless or unwholesome grasses, exhale malaria, generate rot among his sheep, and fevers in his family. A friend of ours once observed, "Sir, when I go to see a gentleman farmer, if he does not invite me to ride over his estate and look at his crops, I always suspect it is because it is full of gullies and bogs, and naked and miry spots!"

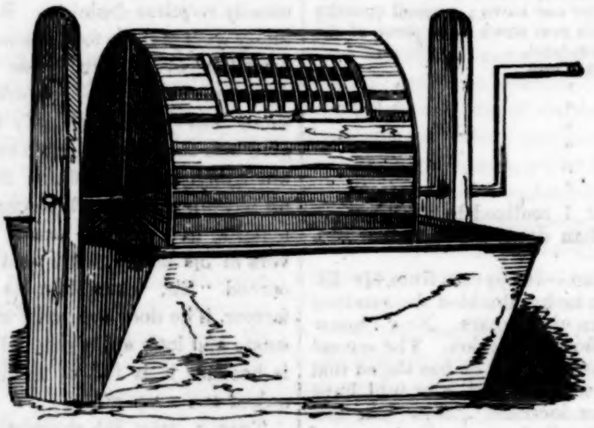
True, it may be answered that draining is very expensive; and so it is, on a large scale and under many circumstances; but this, with many, is a mere pretext for procrastination and want of enterprise. It might often be effected, as by Mr. SOMERS, a plain farmer below Nottingham, in Maryland, by cutting a common ditch, and in the bottom of it laying two poles, side by side, covering these with cedar brush carefully laid down, and then with sods and dirt, and plowing and sowing over the whole. The increased crop in a single year would pay the expense, besides leaving the land, as in his case, worth $20 or $30 an acre for ever after, instead of being a *quagmire*. Who has not remarked that indolence has a very inventive genius of its own when it seeks to excuse itself for its inactivity and love of repose?

POTATO WASHER.

WE are not aware that the machine or utensil, described below, is generally known, though we are sure it ought to be in general use where any considerable number of potatoes are raised, more especially where they are cultivated for feeding stock. The first we ever saw was brought from Scotland, and the only one except one that we got him to have made after it, and was in use, by Mr. BEVAN, manager for the late estimable R. CATON, Esq., of "*Brookland-Wood*," near Baltimore: a gentleman of uncommon amiability and various knowledge—one who possessed a thousand times more of a spirit to be useful to the country and his fellow men, than many who derided his enthusiasm, without emulating the generous impulses in which it was founded and the useful purposes to which it would have prompted him.

This potato washer is one of the most labor saving contrivances we have seen in operation. True, it seems to be a small affair, but every thing that saves a minute is important in a country like ours, where, above all others, labor is high and "*time is money.*"

The annexed sketch of a machine for washing potatoes, which is used in Nottinghamshire, may be acceptable to some of your readers. It is easily made by any village workman, and will be found very effectual. It is simply a churn-like cylinder, with open bars placed at such a distance as to prevent any of the potatoes from falling through, except very small ones, the lower part of which as it revolves, passes through a trough of water.



It may be made to be easily unshipped, like a churn, or fixed more permanently, as in the sketch. Where many potatoes are used, or where it is requisite to wash them for starch-making, it will be found a very valuable acquisition.—*M. J. B.* [We have long used a washer similar to that here figured—differing from it, indeed, but in one particular; that one, however, of considerable importance. The arms here represented as containing the sockets in which the axle of the cylindrical frame revolves, are in our machine not vertical and straight, but arched, and terminating in extremities overhanging the ground, considerably beyond the cistern to which they are attached; the cylinder, too, revolves not in sockets pierced *in* these arms, but in Ys at the side of them; and after—by its revolution—the potatoes in it have been cleaned, chains from the extremities of the arms are hooked into eyes on its axle, and as the rotation proceeds, these, winding up on the axle, lift the cylinder out of the water, and bring it to a position overhanging a box or barrow which has been placed beside the cistern. The trap-door being opened, the potatoes fall into this barrow and are easily removed.]

THE INFLUENCE OF PASTURE ON SHEEP REARED ON IT.

BY MR. WILLIAM HOGG, STOBOHOPE, PEEBLESSHIRE.

SHEEP, as they exist in this country, have a twofold character—a general character, or what belongs to them as a species, and a particular character, or that temperament of constitution which they derive from the pasture on which they are bred. The qualities essential to them as a species are, producing wool each year after being one year old, shedding two incisor teeth, cloven-footed, wild; for domestication is an artificial state, effected only after considerable intimacy, and tasting of human food—this reconciles sheep to human company and human kindness, and disposes the creature to look to man for help in every emergency. These inherent peculiarities belong to sheep as a species. Before tracing their connection with the pasture, it will be necessary to state that pasture may justly be considered as of two divisions—dry, firm, lea pasture, often less or more intermixed with heath. This soil produces the finer grasses, though not in great abundance; the animal which it rears is small sized, of a compact form, hardy, excretions of all kinds small, constitution sound, considerable flow of animal spirits, not easily overcome with privations, and, as the system in all its parts is, as it were, crowded together, it is subject to inflammatory diseases, whether raised by external injury or by the suppression of its natural evacuations. Another description of pastures are such as are spread out on an easy, downy surface. Here flourish all the strong coarser grasses, with a good part of those found in the former division; but they are here rough in the stem, and hold far more fluidity—all the plants peculiar to a damp, deep soil arrive here at perfection, and a soft, *lathy* quality pervades the whole. The animal here feeds to excess—viscera increase to a great size and weight—the carcass is large, loose, and incompact—staples of the wool generally long, inclining rather to coarseness, if pains be not taken to keep the fleece pure—not much animation—and, for the most part, in their fifth year, swell out to a great belly. The constitution does not now become invariably unsound, it rather becomes unwieldy, and burthensome for the animal to search for and gather its food; evacuations at all times profuse, and that natural purgation common to all sheep in spring is here apt to be continued well into summer, which not a

little delays the animal's mending. The diseases peculiar to such a constitution and such a pasture are of a plethoric description. If the spirits are broken by any misfortune, ill-usage, [fright by dogs] or a severe winter, the rot, with all its enfeebling symptoms, appears. Should this disease not manifest itself, yet the creature falls into an unprosperous, unthriving condition, having slight signs of sundry diseases though the exclusive symptoms of none. It, however, turns useless and dies. From these facts it must not be surmised that I suggest this as the common fate of entire stocks bred on soft pastures. Though the constitution is far from being unsound, yet it is quite inferior to those reared on the first division: it is not so strong and hardy. The soft constitution is burthened with infirmities and disabilities which the former is altogether unconnected with, and an interruption of thriving, which ill-usage or ill seasons bring on individual sheep of this constitution, generally terminates in the rot, or ailments similar to it.—Again, almost each distinct pasture gives a tinge to the fleece; this tincture is generally attributed to the color of the upper stratum of the soils; and, when we consider how assiduously thriving sheep amuse themselves on disruptions or openings of the stratum, this cannot be doubted; yet there is an imbuing quality in the herbage which communicates a tinge to wool independent of that inserted into it by friction; but whether this is produced by the quality of its food after being eaten, or is imparted to the wool as the animal traverses its pasture in search of food, I can scarcely determine. But pasture exercises an almost uncontrollable power over the shape. If it does not interfere too much with the breed, the pasture will adjust the size to what it can itself support; but how it determines the external shape remains as yet unaccounted for. In some cases the shape is unexceptionable, that is, the figure, motion, and mien of the stock indicate strength, spirits, and health; in others, it is ill-proportioned or defective in those points which ensure animation and activity.—The most common as well as the most hurtful defects are, low and thin in the fore quarters, coarse and lumpish in the posteriors, narrow or sharp-backed—its gait oblique and ambling, splay-footed, &c. Though the last two are conspicuous among individuals, they can scarcely be said to be peculiar to a stock in general, but the obstinacy with which any of these defects resist a change for the better indicates they are communicated by the soil, are interwoven with the constitution, and, if strenuous and uninterrupted means are used for their removal, they may, in a small measure, disappear, or the distinguishing peculiarities of the deformity not be so strongly marked. But, rather than relinquish the animal altogether, if vigorous exertions are still made for their utter suppression, the constitution not unfrequently yields with the struggle—it falls into an unprosperous, sickly state, and, finally, ends in being an unprofitable, useless creature. Indeed, man, for no end whatever, regularly and constantly interferes with the propagation of sheep, though accession of fresh blood be necessary at times, for keeping the animals healthy, recruiting the spirits, increasing animation, &c.; yet an often transmission of *new blood* [crossing with a different breed] into the progeny prevents the spirits from acquiring a permanent and steady flow or the body from settling into a fixed and useful proportion of strength. From an actual survey of the position, altitude, and qualities of such an extent of hill-pasture as is generally set off as a sheep-farm, one accustomed to the rearing of sheep stocks, and to notice the connection which exists between the animal and its pasture, may discover with tolerable certainty whether the constitution will be hardy or sickly—whether of a large or small bone—whether yield a scanty or abundant fleece; and, from these peculiarities, may be enabled to say, with an accuracy which may be depended on, and which will be found in general to be correct, what are the most prevalent diseases to which the stock is liable; but the properties in the soil which so forcibly confer the external figure have never yet, that I know, been discovered. Wherever that plastic power resides, I am convinced that the way and manner which the sheep accustom themselves to, in pasturing their allotted range, has not a little influence in forming the exterior shape; and it is certain that the method of pasturing is regulated by the soil, so that still the qualities of the pasture lie at the foundation of all peculiarities, whether natural or acquired; but yet an uneasy manner of collecting the food, if continued in for a length of time, may come in to the aid of those occult qualities in the soil which give the shape, and enable them to act with greater and more certain vigor. It may be thought that, if the figure of each individual in the stock is unexceptionable in its first application to the pasture, there will be no difficulty in perpetuating this shape almost to any length of time; the reverse, however, is certain. The pasture may accord with the proper figure—may support it in its most important points; but if an adverse property reside in the pasture, *it will imperceptibly alter the original form, by imposing on each successive crop of lambs that mould and manner which it is its own exclusive property to give.**

There is a train of circumstances which never fail to alter the true shape, not only of the subject on which they immediately act, but also on their progeny. Suppose an individual sheep, or say stock of sheep, are reduced very low in habit by the sufferings of a severe winter: First season they somewhat shrink from the true figure; but suppose, as is often the case, that for two or three seasons the same privations continue, the departure from the true figure is evidently on the increase, is transmitted to the issue, and the deformity becomes in a sense habitual, though not in so absolute a degree as that which the soil imposes. In this case, if good seasons and prudent management coöperate, a restoration of the right shape is possible; but to establish a true and fashionable form on a stock whose plastic influence seems to confirm a defect in the shape is impossible. The change of stocks from the Heath to the Cheviot breed has not a little altered the disposition, look, and manner of sheep; but when all traces of the former are completely obliterated, and the peculiarities of the latter startlingly confirmed, what reprehensible points the pasture was the cause of in the old breed are still found to be blemishes in the new. From the above notices, it may be inferred that the proper figure and shape of some stocks can with far greater easiness be brought to a just proportion of parts, and kept at them

* So, too, we have maintained as to grain, tobacco, fruit, &c.—Nature will not be forced; soil and climate will force things connected to them to alter their nature to suit them while *they* remain unchanged. [*Ed. Farm. Lib.*

as a right standard, than others where the qualities in the soil operate to the production and continuance of defects. This is found in fact to be the case. Some stocks require little attention: others, if the manager make strenuous and incessant endeavors to establish a useful figure, may, perhaps, enfeeble the whole system by too frequent accessions of new blood; for, to continue sheep profitable, healthy, and beautiful, the line should not be too often disturbed with intromissions from other families, however pure.

To write ever so explicitly on this subject can convey no perfect notion to another person's mind of the dissimilarity which exists between sheep stocks reared on different pastures; one single look over them would make the idea more distinct, and more certain of the inequality, than any words can convey; but the fact that each pasture impresses its peculiar shape, air, and manner, need not be doubted, and this unlikeness exists after every safe method is taken to bring them to a uniformity.

[Jour. of Highland and Agr. Soc. of Scotland.

Bees.—*Statistics of Swarming.*—In this account of swarming, the Bees, being in the common straw-hive. were left to follow their natural inclination. The statement extends over a period of 10 years. 40 old hives produced 64 swarms; three swarms flew away, two of which were lost through inattention; 16 swarms were in May, 38 in June, 9 in July, and 1 in August. Five old hives did not swarm, one swarm swarmed once, and two swarms sent forth each two colonies; three of the old hives swarmed thrice each. The worst honey seasons were 1839, 1841, and 1845, in which years the average of swarms per old hive was the greatest, being respectively 2½, 2 1-5, and 2 In the best honey seasons there was less swarming, the average being 2, 1, 1¼, and 1½. The earliest swarm in the 10 years was on May 9th, the latest on August 11th; the earliest hour of swarming, 9 o'clock, A. M.; the latest, half-past 3 o'clock, P. M. The greatest weight of first swarm, 6 lbs.; of second swarm, 4¾ lbs. The second swarms were generally, accompanied with more than one queen. This was also the case with two first swarms, which, doubtless, arose from the old queens having died about the commencement of the swarming season. In one of the cases the queen was observed dead in front of the hive. Many thousands of the Bees continued to cluster around the hive till the 10th or 11th day, when a swarm of 6 lbs. left, in company with several queens.—B. T. [Foreign paper.

☞ The friends of Agriculture will be happy to learn that Hon. J. C. Calhoun has been appointed to deliver the next Anniversary Address to the South Carolina Agricultural Society—*The cause is looking up.*

PRICES CURRENT.

[*Corrected, December 27, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort ₱ 100 lb.	3 75 @— —
Pearls, 1st sort, '45	4 12½ @— —
BEESWAX—American Yellow	— 29½ @— 30½
CANDLES—Mould, Tallow ₱ lb.	— 9 @— 11
Sperm, Eastern and City	— 26 @— 38
COTTON—From ₱ lb.	— 6¼ @— 9¼
COTTON BAGGING—American	— 12 @— 13
CORDAGE—American ₱ lb.	— 11 @— 12
DOMESTIC GOODS—Shirtings, ₱ y.	— 5½ @— 11
Sheetings	— 7 @— 15
FEATHERS—American, live	— 28 @— 32
FLAX—American	— 7 @— 7½
FLOUR & MEAL—Genesee, ₱ bbl.	5 62½ @— —
Troy	5 62½ @— —
Michigan	5 56¼ @ 5 62½
Ohio, flat hoop	5 56¼ @ 5 62½
Ohio, Heywood & Venice	6 75 @— —
Ohio, via New-Orleans	— — @— —
Pennsylvania	— — @— —
Brandywine	— — @ 6 —
Georgetown	5 75 @ 5 87½
Baltimore City Mills	— — @ 5 75
Richmond City Mills	7 — @— —
Richmond Country	5 75 @ 6 —
Alexandria, Petersburg, &c.	— — @ 5 75
Rye Flour	4 25 @ 4 37½
Corn Meal, Jersey and Brand	4 25 @ 4 37½
Corn Meal, Brandywine hhd.	18 — @— —
GRAIN—Wheat, Western ₱ bush.	1 20 @ 1 30
Wheat, Southern new	1 20 @ 1 25
Rye, Northern	— 80 @— —
Corn, Jersey and North (meas.)	— 80 @— 83
Corn, Southern (measure)	— 70 @— —
Corn, Southern (weight)	— 70 @— 71
Oats, Northern	— 45 @— —
Oats, Southern	— 38 @— 40
HAY—North River bales	— 95 @ 1 —
HEMP—American, dew-rotted ton	80 — @95 —
" " water-rotted	125 — @175 —
HOPS—1st sort, 1845	— 20 @— 35
IRON—American Pig, No 1	35 — @37 —
" Common	25 — @30 —
LIME—Thomaston ₱ bbl,	— 97½ @— —
LUMBER—Boards, N.R., ₱ M. ft. clr.	35 — @40 —
Boards, Eastern Pine	10 — @11 —
Boards, Albany Pine ₱ pce.	— 8 @— 18
Plank, Georgia Pine ₱ M. ft.	33 — @40 —
Staves, White Oak, pipe ₱ M.	48 — @50 —
Staves, White Oak, hhd.	38 — @40 —
Staves, White Oak, bbl.	28 — @30 —
Staves, Red Oak, hhd	30 — @31 —
Hoops	25 — @30 —
Scantling, Pine, Eastern	14 — @16 25
Scantling, Oak	30 — @35 —
Timber, Oak ₱ cubic foot	— 25 @— 37
Timber, White Pine	— 18 @— 25
Timber, Georgia Yellow Pine	— 30 @— 35
Shingles, 18 in. ₱ bunch	1 75 @ 2 —
Shingles, Cedar, 3 feet, 1st quality.	— — @24 —
Shingles, Cedar, 3 feet, 2d quality.	20 — @22 —
Shingles, Cedar, 2 feet, 1st quality.	— — @17 50
Shingles, Cedar, 2 feet, 2d quality.	15 — @16 —
Shingles, Cypress, 2 feet	11 — @13 —
Shingles, Company	— — @29 —
MUSTARD—American	— 16 @— 31
NAILS—Wrought, 6d to 20d ₱ lb.	— 10 @— 12½
Cut, 4d to 40d	— 4 @— 4¼
PLASTER PARIS—₱ ton	2 62½ @— —
PROVISIONS—Beef, Mess, ₱ bbl.	8 — @ 8 50
Beef, Prime,	5 — @ 5 50
Pork, Mess, Ohio	13 25 @13 37½
Pork, Prime, Ohio	10 25 @10 50
Lard, Ohio ₱ lb.	— 8 @— 8½
Hams, Pickled	— 7½ @— —
Shoulders, Pickled	— 5½ @— —
Sides, Pickled	— 6½ @— —
Beef, Smoked ₱ lb.	— 7 @— 7½
Butter, Orange County	— 18 @— 20
Butter, Western Dairy	— 15 @— 17
Butter, ordinary	— 12 @— 14
Cheese, in casks and boxes	— 7 @— 8
SEEDS—Clover ₱ lb.	— 10 @— 11
Timothy ₱ tierce	15 — @17 —
Flax, Rough	10 37½ @— —
SOAP—N. York, Brown ₱ lb.	— 4 @— 6
TALLOW—American, Rendered	— 7½ @— 7¾
TOBACCO—Virginia @ lb.	— 3 @— 6
North Carolina	— 3 @— 5
Kentucky and Missouri	— 3 @— 7
WOOL—Am. Saxony, Fleece, ₱ lb.	— 38 @— 40
American Full Blood Merino	— 36 @— 38
American ½ and ¾ Merino	— 30 @— 33
American Native and ¼ Merino	— 26 @— 28
Superfine, Pulled	— 29 @— 31